THE INDUSTRIAL-ARTS MAGAZINE

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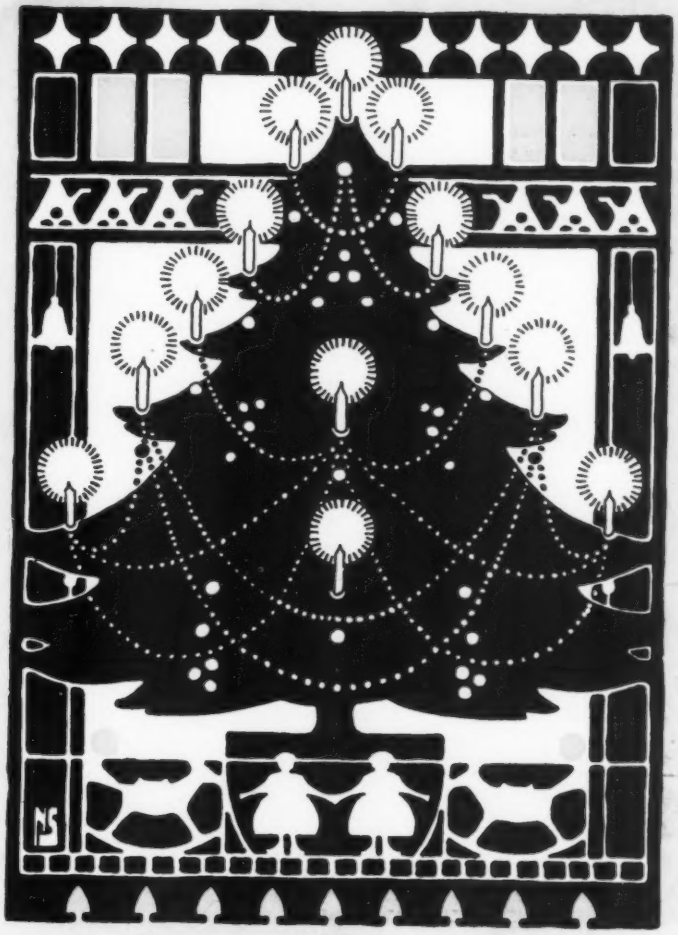


DECEMBER - 1923

THE BRUCE PUBLISHING COMPANY
MILWAUKEE - WIS.

ATKINS
SILVER STEEL SAWS

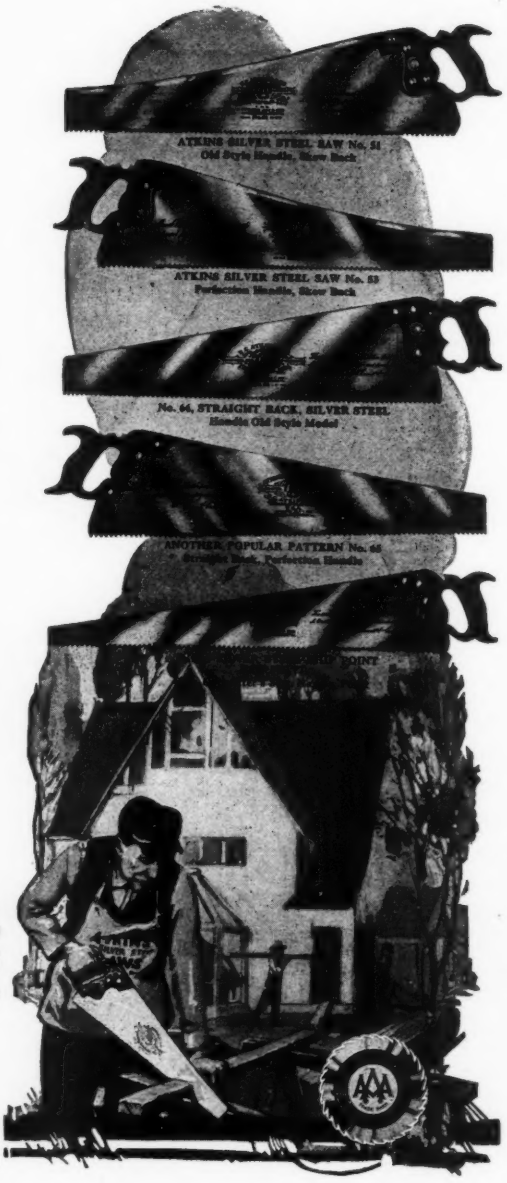
Christmas is Coming!

And with its coming, one's thoughts naturally turn to gifts of remembrance—utility gifts.

The age-old question of what to give HIM can be easily settled right here and NOW.

What could be better than an Atkins Silver Steel Saw—our No. 400—the Elite of the Saw World—

Can you imagine the delightful surprise in store for Father, Son, Brother, Sweetheart or Buddy when he opens his presents on Christmas morning to see a bright, shiny Atkins Saw, made of Silver Steel, Mirror Polish, Genuine Solid Rosewood Handle of our Improved Perfection pattern, attached to the saw with nickeled screws; put up attractively and neatly in a special blue and white box for the holidays? Can you? Wouldn't it make you feel happy? Sure it would.


ATKINS SILVER STEEL SAW No. 51
Old Style Handle, Skew Back
ATKINS SILVER STEEL SAW No. 53
Perfection Handle, Skew Back
No. 64, STRAIGHT BACK, SILVER STEEL
Handle Old Style Model
ANOTHER POPULAR PATTERN No. 65
Straight Back, Perfection Handle
POINT

If you want to know how to get an Atkins Silver Steel Saw for Christmas, send ten cents in coin or stamps to cover cost of mailing and we will send by mail a beautiful gold plated miniature saw charm and a Saw Sense Book, provided you will give us the name and address of your hardware merchant. Full information will accompany our letter. Clip this out and send it NOW.

E.C. ATKINS & CO.

ESTABLISHED 1857 THE SILVER STEEL SAW PEOPLE

Home Office and Factory, INDIANAPOLIS, INDIANA

Canadian Factory, Hamilton Ontario

Machine Knife Factory, Lancaster N.Y.

Branches Carrying Complete Stocks In The Following Cities:

Atlanta	New Orleans	Seattle
Memphis	New York City	Paris, France
Chicago	Portland, Ore.	Sydney, N. S. W.
Minneapolis	San Francisco	Vancouver, B.C.

Choosing the Proper Finish Is Important

Johnson's Artistic Wood Finishes are now being used in nine-tenths of the schools in United States and Canada. They are particularly adapted for manual training work as they may be applied by the youngest and most inexperienced pupils with good results.

JOHNSON'S *ARTISTIC* WOOD FINISHES

The finishing of manual training models is assuming more and more importance every year. Surely it is a subject which should be given its share of attention, for a beautiful model may be ruined if improperly finished, whereas the defects of a poorly constructed model are minimized if well finished.

Johnson's Artistic Wood Finishes are very easy to use. Boys in the Fifth and Sixth grades can use them successfully. Simple instructions are printed on every label.

The finishes more popular among Training Instructors and Pupils are: Johnson's Wood Dye, Prepared Wax, Under Lac, Paste Wood Filler, Varnishes, Undercoat and Enamel.

Submit Your Problems to Our Individual Service Department

We have a very attractive exhibit of wood panels finished with these products which we are glad to send, free and postpaid, to Manual Training instructors who will give it wall space in their shops.

At all times we are glad to furnish Manual Training Instructors with specially finished panels of wood for class room use, also with working samples. There is no obligation whatever connected with this offer. Don't hesitate to avail yourself of it.

FREE—Book on Wood Finishing

Our Book is a valuable text book on Wood Finishing and should be in the hands of every instructor of Industrial and Vocational Education. It is full of information on finishing all wood—hard or soft—old or new. Tells how inexpensive soft wood, such as pine, cypress, fir, etc., can be finished so they are beautiful as hardwood.

This Book is the work of experts — profusely illustrated in color — includes color charts — gives covering capacities, etc. New edition is just off the press. We will gladly send it free.

S. C. JOHNSON & SON, Dept. I.A.-12, RACINE, WIS. (Canadian Factory — Brantford).

Please send me free and postpaid your text book on Wood Finishing. We usually buy finishing materials from

Dealer .....

My Name.....

My Address.....

City and State.....

Bench Lathe
No. 494
Price $40.

This lathe makes teaching easier

With a good bench lathe, students are pretty apt to do good work and learn to handle almost any kind of turning or boring job well.

The Goodell-Pratt Bench Lathe illustrated is just the right size for school use. Length over all, 31 inches. Height 11½ inches. Swing, 7 inches. Extreme distance between centers, 12 inches.

With this lathe is included an adjustable Tee Rest, a Slotted Face Plate, a Saw Arbor and a Drill Chuck with a No. 1 Taper shank. The chuck holds round shanks of all sizes from 0 to ¼ inch.

1500 Good Tools

If you are familiar with the Goodel-Pratt line, you know that there is a tool made for every conceivable kind of job.

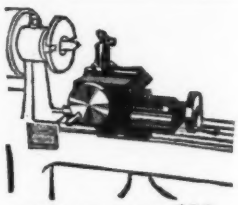
Each of the 1500 Goodell-Pratt Tools is made for good workmen by good workmen — toolsmiths who have spent their lives in the business.

Write for complete details concerning the Goodell-Pratt Bench Lathe and whatever other tools in which your school may be interested.

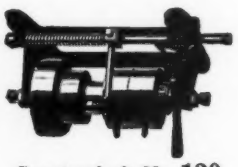
GOODELL-PRATT COMPANY, Greenfield, Mass., U. S. A.

Toolsmiths

GOODELL-PRATT
1500 GOOD TOOLS



Slide Rest No. 132
Price $16.



Countershaft No. 130
Price $11.

Mr. Punch says:
"Teach a young fellow to use a bench lathe properly and you have gone a long way toward his education.

45 YEARS YOUNG

A TOOL has to be more than good to last 45 years. It has to be the best of its kind. That is why the Morrill Sawset, introduced in 1878, and constantly improved upon, is the standard of the World. Whenever we see a way to make it simpler, better and more efficient we do it.

"Saw Points", a booklet on "How to Joint, Set and File Saws," and used by many Manual Training Teachers as a Text Book, will be sent free to any teacher upon request.

"Special" and No. 1 for Hand Saws not over 16 gauge.
No. 3 for Cross Cut and Circular Saws 14 to 20 gauge.
No. 4 for Double Toothed Saws 14 to 20 gauge.
No. 5 for Timber and Board Saws 6 to 14 gauge.

Our name Morrill and trade mark is stamped on every tool of our manufacture.

CHAS. MORRILL
94 La Fayette St. **New York, N. Y.**

MAYDOLE HAMMERS
THE WORLD'S STANDARD

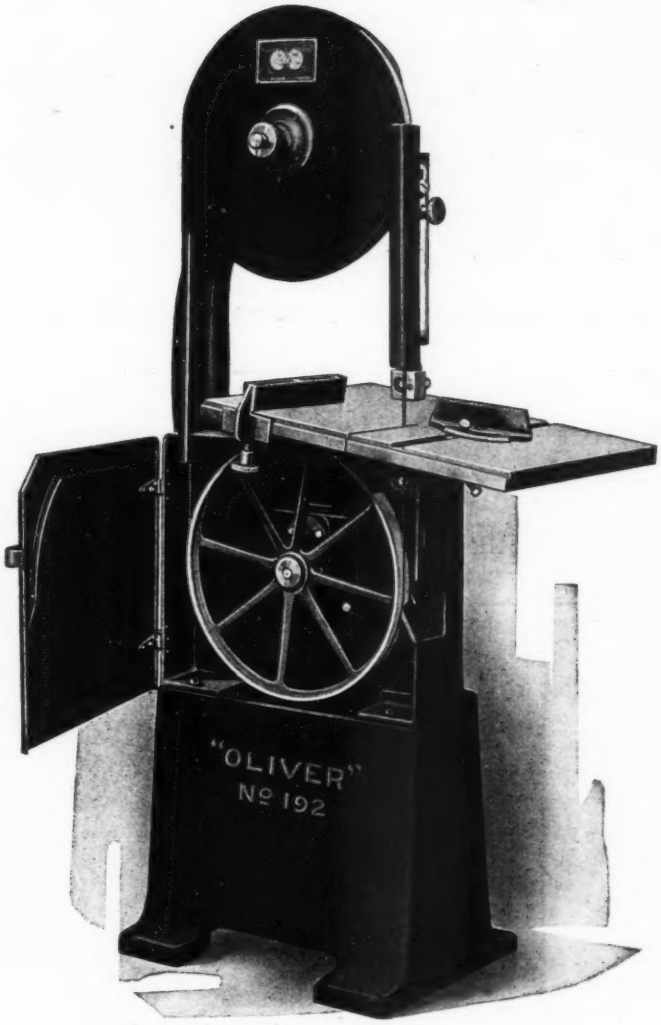
There are none better made—none better known. When you buy these hammers, you are certain of getting the best. They are used the world over.

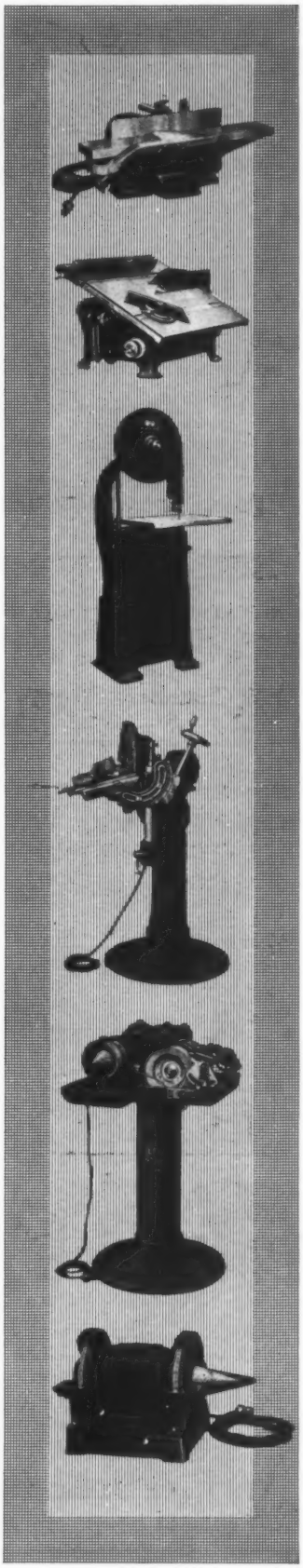
Maydole Hammers are made of finest quality material, and guaranteed first-class in every respect.

Write for our booklet of useful information, which every student should have. How many shall we send?

The David Maydole Hammer Company
NORWICH NEW YORK U. S. A.

"Oliver" Portable Woodworking Machinery





This is the "Oliver" No. 192, 18-inch Universal Band Saw. The variety of work it will do is surprising. It has ripping fence, miter and cut off gauges for angle work and cutting off. The table tilts and of course circular and scroll sawing is easy. It operates from a lamp socket. Send for catalog of Portable Machines.

Oliver Machinery Co.

Grand Rapids, Mich., U. S. A.

GRIFFIN
COPING SAW BLADES

Manual Training Instructors

who have used the Griffin Coping Saw Blades for many years testify to their uniform high quality, good temper, and well "set" teeth. Don't you think they are

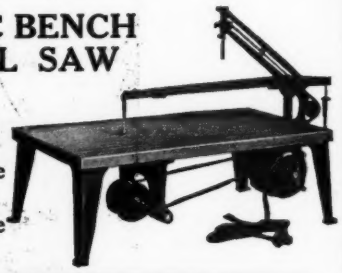
Good Judges?

ALWAYS SPECIFY "GRIFFIN" Coping Saw Frames and Blades. Your Dealer will supply you—if not, write us.

SALES DEPARTMENT

113 Chambers Street NEW YORK JOHN H. GRAHAM & CO. **268 Market Street San Francisco, Calif.**

BARNES ELECTRIC BENCH SCROLL SAW



Will saw
2 inch Pine at
2½ ft. per minute
2 inch Maple at
1½ ft. per minute

BARNES

BARNES ELECTRIC BENCH FORMER

The above machines are not toys but practical well built tools,—they are portable and a lamp socket proposition. Just the machine for Manual Training Purposes.

Send for Bulletin No. 30 W.

Made by

W. F. & John Barnes Co.

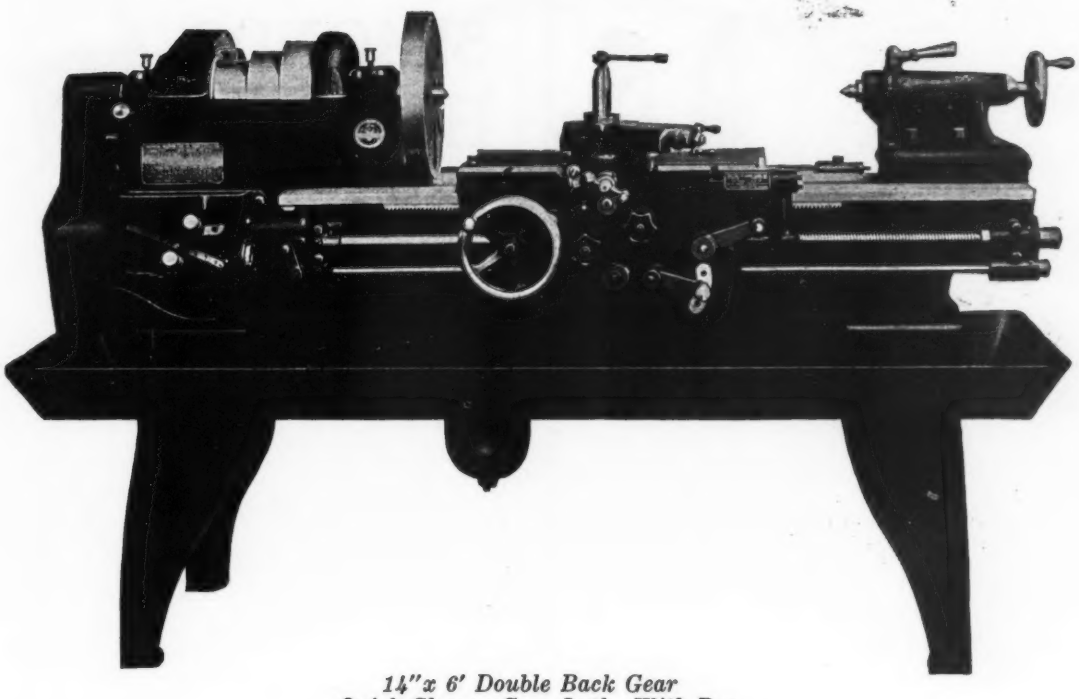
996 Ruby St. Rockford, Illinois

TRADE MARK

"STAR"
Hack Saws

The Blade with a Reputation is built upon the metal cutting performance record of forty years. STARS cut faster and cut longer. Personal service, information, advice and price lists on all Hard and Flexible Hand Blades, and on Power Blades, sent on request.

CLEMSON BROS., Inc.
MIDDLETOWN, N. Y.
Makers Since 1883



14"x 6' Double Back Gear
Quick Change Gear Lathe With Pan

More Monarch Lathes are being used in manufacturing plants throughout the country than any other make. More Monarch Lathes are being installed in Manual Training Departments of schools than any other make of lathe. The student, upon completion of his school work, will find himself coming in contact with Monarch Lathes in most shops.

Monarch Lathes are built in sizes ranging from 9 inch to 30 inch swing, and bed lengths from 2½′ to 30′.

Our Engineering Department will gladly submit plans and layouts for machine shop installations and we are in position to give Vocational Instructors valuable information and plans, for which no charge is made.

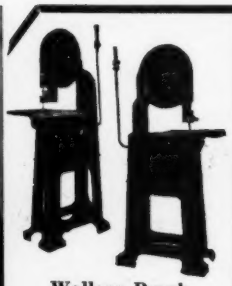
There is a Monarch Dealer near you, who will gladly show you the merits of Monarch Lathes.

Let us send you Special Vocational Bulletin.

THE MONARCH MACHINE TOOL CO.

304 OAK STREET **SIDNEY, OHIO**

Largest builders of high grade engine lathes and specialist in lathes for Vocational Training.



Wallace Bench Machines

16" Band Saw (Illustrated)
6" Jointer
4" Planer
Universal Saw
Plain Saw
6" Lathe
Electric Glue Pot with Automatic Heat Control
Electric Solder Pot with Automatic Heat Control

Profit By Experience

The accuracy, dependability and efficient application of power which makes Wallace Portable Bench Machines the universal choice of practical woodworkers makes them equally satisfactory in the hundreds of Manual Training Schools using them for purposes of instruction.

Bear this in mind when considering new equipment.

Descriptions and prices sent on request.

J. D. Wallace & Co.
1415 W. Jackson Blvd.,
Chicago, Ill.

SIMONDS Hand Saws

Made to Give the Utmost in Cutting Results

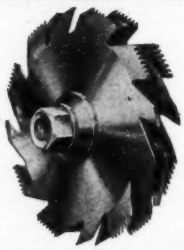
Best for Manual Training Schools

SIMONDS
Saw and Steel Co.
Fitchburg, Mass.
Chicago, Ill.

V&B Braces

Do you have trouble with your end screw attachment? V & B Braces, with their patented key construction, make such troubles a thing of the past. A quality tool, of course!

VAUGHAN & BUSHNELL MANUFACTURING COMPANY
Makers of Fine Tools
2114 Carroll Ave. Chicago, Ill. U.S.A.



YOU NEED A HUTHER DADO HEAD

The saw that makes intricate cutting and grooving simple

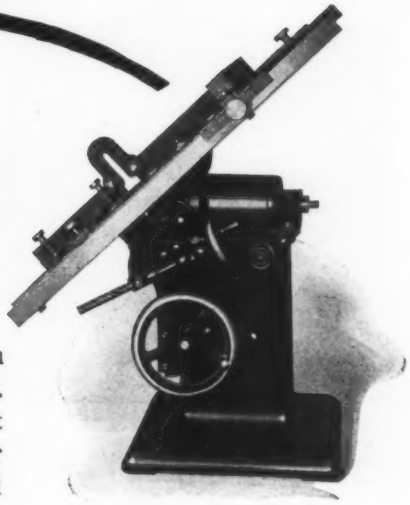
This saw, developed from our own patents, consists of two outside cutters and a sufficient quantity of inside ones to perform the required cut. The outside cutters can be used singly or in pairs as required.

Every builder or contractor, wishing lock corners or any sort of grooving, will find his production costs lowered by this saw.

Write for complete information and prices, or send for one on approval. It may be returned at our expense if unsatisfactory.

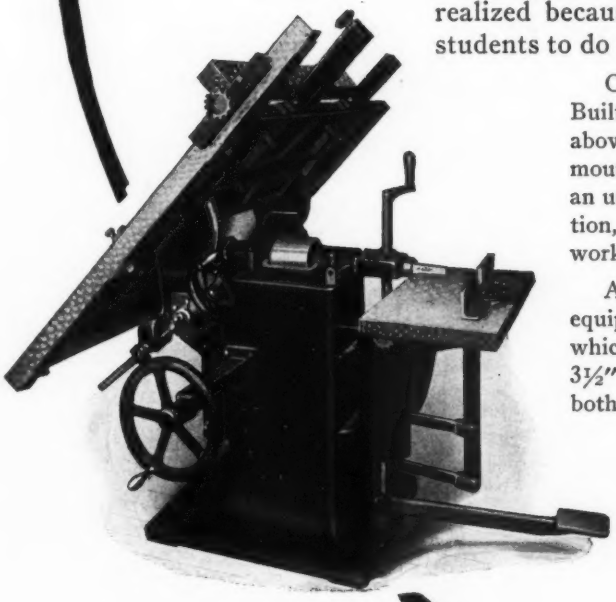
HUTHER BROS. SAW MFG. CO.
Rochester, N. Y.

Building the Men of Tomorrow!



VOCATIONAL Schools play a big part in the building of the men of tomorrow. The influence of school-days environment extends far into the years of maturity. For that reason, both pupil and teacher should have the benefit of dependable equipment,—tools of accuracy and quality,—that their inspiration may be of the highest order.

Sidney-built Tools appeal to both student and teacher because of their in-built quality and reputation for accurate work. As a consequence, better results are realized because the quality of Sidney Tools inspires students to do their best.



On this page are shown two views of the Sidney-Built P-W No. 26 Variety Saw Bench. The view above shows the motor-drive model, with motor mounted direct on arbor. This arrangement makes an unusually powerful unit, entirely free from vibration, therefore particularly adapted to precision work in manual training departments.

At the left is shown the belt driven model equipped with hollow-chisel mortising attachment, which will cut mortises from ¼" to ¾" square and 3½" deep. Complete equipment furnished with both these models.

Send for Special Bulletin on the complete Line of Sidney-Built Tools for Vocational Schools, consisting of Band Saws, Jointers, Planers, Saw Benches, Mortisers, Universal Woodworker and Metal Working Lathes. These Bulletins contain interesting information for Vocational Teachers and Boards of Education. Mailed Free on request. Address, Dept. 412.

A Special Service
for Vocational Schools

You can get the help of our Engineering Dept. in laying out, equipping or re-arranging your Manual Training Dept., entirely without obligation. Ask us about this free service.

The Sidney Machine Tool Co.
Sidney, Ohio.

SIDNEY **Tools for Vocational Schools**

Ask any Machinist

You can't learn to do accurate work with inferior tools. Start with Starrett — the finest aids to good workmanship a man can have.

Each tool in these Starrett Sets is a tool that journeyman experience has proved to be essential to the student or apprentice. And every tool with proper care should last a lifetime. **Ask any machinist.**

Write for Catalog No. 22CE and the Supplement describing the new Starrett Tools.

THE L. S. STARRETT CO.
The World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled
ATHOL, MASS.

Starrett Student and Apprentice Sets No. 900 (in folding leather case) and No. 901 (in nicely finished wood case).

Starrett Tools

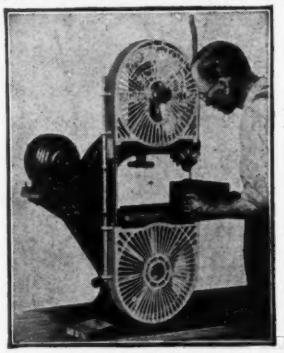
5888

You Can Teach

...nstead of the men ...e work. We now have two general principles in all operations—that a man shall never have to take more than one step, if possibly it can be avoided and that no man need ever stoop over.
Henry Ford in "Development of the Ford Industry."

Ford's Principles

Writes Henry Ford, in his story of the development of the Ford Industry, "We now have two general principles in all operations—that a man shall never have to take more than one step, if possibly it can be avoided, and that no man shall need ever stoop over." You can teach these principles in your saw operations—



by Using Racine Duplex Band Saw

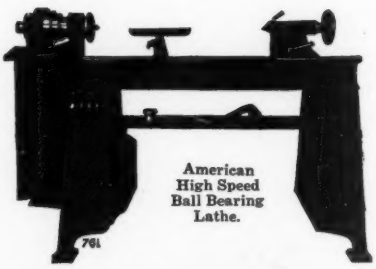
for Wood, Soft Metal, or Steel

Besides being a rugged, durable tool for the school shop, the scientific design of the Racine Duplex Band Saw makes it an excellent example of Modern Machine Tool Practice. It is convenient to use—there is no stooping—the vibrationless, ball-bearing construction saves saws and insures good work. And the change speed feature permits cutting every material your students use.

Use "Racine" H.S. Wood and Metal Band Saw Blades and "Racine" H.S. Tungsten Power and Hand Hack Saw Blades.

RACINE TOOL & MACHINE CO.
1403 Jones Ave. Racine, Wis., U. S. A.
Manufacturers of the Famous
Racine H.S. Metal Cutting Machines
Bulletin giving complete details sent on request.
"STANDARD THE WORLD OVER"

Careless Fingers!!



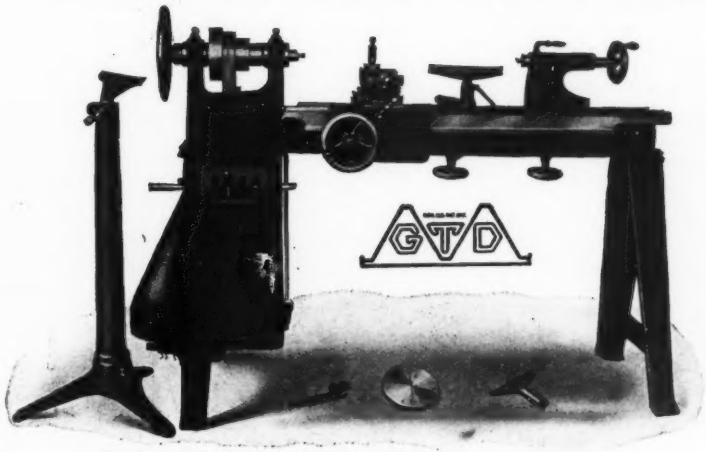
Even the slap-dash, careless fingered student is unusually safe when operating the AMERICAN HIGH-SPEED BALL BEARING LATHE. The motor, drive pulleys and belt are inclosed. All hand shifting is eliminated by a sure one handle belt control and shifting device. Quick-acting emergency brake on head stock. SAFETY is really "first" and simplicity of operation combined with ruggedness under exacting strains a close "second" in the design of this splendid machine. It is your duty to know more about it. Write us today for complete specifications.

The same service standards are found in AMERICAN saw benches, jointers, planers, band saws and wood-workers.

American Saw Mill Machinery Company
74 Main St. Hackettstown, N. J.

AMERICAN
MANUAL TRAINING EQUIPMENT

A Lathe that will "Stand The Gaff"



No. 218 GTD Demonstration Lathe—for wood or steel.

Here is a lathe that is designed especially for standing up and delivering the goods under extra hard treatment — designed that way because we know that inexperienced operators, in spite of the best intentions, are hard on machines.

They can't injure the GTD lathe. It's guaranteed to render service under the most exacting conditions. Moreover the prospective user has the option of several different models, so that the selection of one suited to his own particular needs should be very easy.

Our Machine Tool Department will be glad to help in any way possible.

If you are in any way interested or responsible for the purchase of vocational equipment, or the greater success of vocational classes, write NOW for complete information on lathes.

GREENFIELD TAP AND DIE CORPORATION
GREENFIELD, MASSACHUSETTS

THE JOHNSON FRICTION CLUTCH

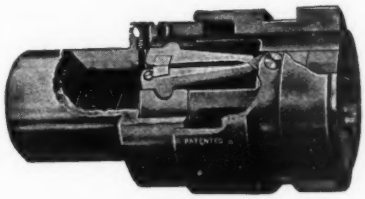
Friction Clutches from Stock

For Use in the Manual Training Departments of Technical High Schools and Universities

Friction Control Means Better Machinery

And the Johnson Clutch is supreme among friction clutches. Adopt it as your standard—always dependable and always promptly obtained.

Complete engineering service to consult on your problems and to handle special installations of any kind.



Single Clutch Broken Away

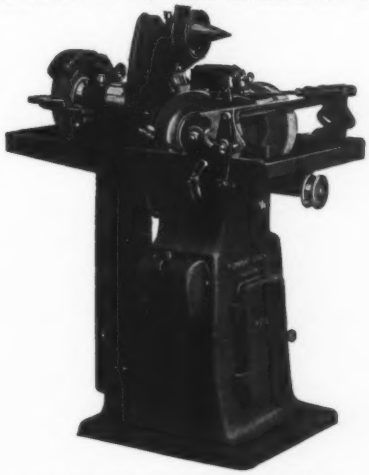
Write for Catalog "IAM"

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

MUMMERT-DIXON OILSTONE GRINDERS

The Modern Edge Tool Sharpening Machines

THE STANDARD FOR ALL INDUSTRIAL SCHOOLS



No. 481—Motor or Countershaft Drive.

An automatic attachment for grinding long knives can be furnished with this machine.

THE FIVE LEADING FEATURES

1. Coarse Oilstone Wheel
2. Fine Oilstone Wheel
3. Grinding Cone
4. Leather Wheel
5. Emery Wheel

ALL AT YOUR FINGERS' ENDS

Send for full descriptive bulletin

MUMMERT-DIXON CO.
Hanover, Pa.

UNION PORTABLE & BENCH MACHINES

complete with individual motor and switch to start and stop are ideal manual training school equipment.

16-inch Band Saw

Safety provisions are taken care of to the limit

Any lighting circuit your power supply line

Portable Truck Type Pedestal illustrated, affords not only a convenient means of moving machines from place to place but an ideal base for the machine when in operation.

SEND FOR BULLETIN DESCRIBING UNION

Universal Saw Bench
Plain Saw Bench
Single Spindle Shaper
16" Band Saw
6" Joiner
4" Joiner

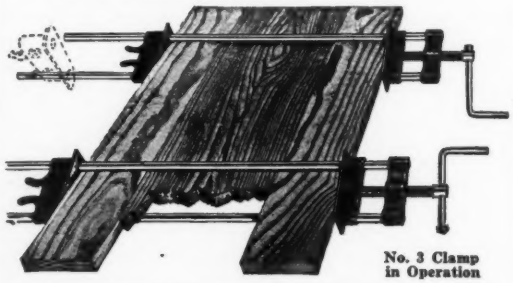
Combination Universal Saw Bench and 6" Joiner

The price is small enough so that it is not necessary to restrict this equipment.

GALLMEYER & LIVINGSTON CO.
388 Straight Ave., S. W.
GRAND RAPIDS, MICHIGAN

HARTFORD DOUBLE BAR CLAMPS

are a decided aid in class work since they eliminate the possibility of buckling. Better results are accomplished when the danger of spoiling the work is minimized. The bar on each side of the wood maintains uniform pressure.

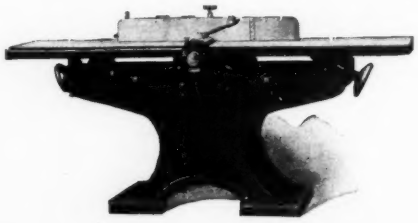


No. 3 Clamp in Operation

HARTFORD No. 6 Double Bar Clamps are also used extensively as presses—for veneering, gluing posts, chair arms, etc. The cost, however, is much less and the saving worth your consideration. Your first order will be followed by others.

Send for Catalog No. 10, which contains complete price list on single and double bar clamps, hand screws and "C" Clamps.

HARTFORD CLAMP CO.
308 Pearl St. Hartford, Conn.



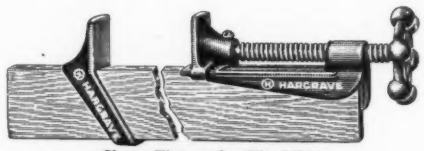
CRESCENT WOOD WORKING MACHINES are durable, dependable, reliable. You should make it possible for your students to become familiar with CRESCENT quality.

Send today for catalog of band saws, saw tables, jointers, borers, disk grinders, planers, planers and matchers, swing saws, cut off tables, shapers, mortisers, variety wood workers, universal wood workers.

The Crescent Machine Co.
25 Main Street,
Leetonia, Ohio, U. S. A.

Standard Carriage Clamp—Sizes 2½" to 12"

Perfection Steel Bar Clamp—Sizes 2' to 10'



Clamp Fixture for Wood Bar

We manufacture a complete and up-to-date line of Clamps, ranging in size from 1 in. to 10 ft. opening, also many other improved mechanics' tools which should interest you. Write for our new catalog.

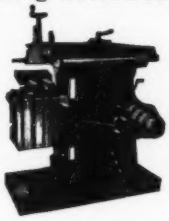
Ask your dealer for HARGRAVE QUALITY TOOLS

THE CINCINNATI TOOL CO.
Established 1879 Waverley Ave. and C. L. & N. Ry.
Incorporated 1884 CINCINNATI, OHIO

SHAPERS MILLERS ENGINE LATHES

14"x6'—$450.00
16"x6'—$500.00
With Quick Change Gear Box
$85.00 extra

Moderate price machine tools — practically fool proof — ideally suited for school shops. Thousands in use all over the world giving daily satisfaction. Send for list of schools using STEPTOE equipment.

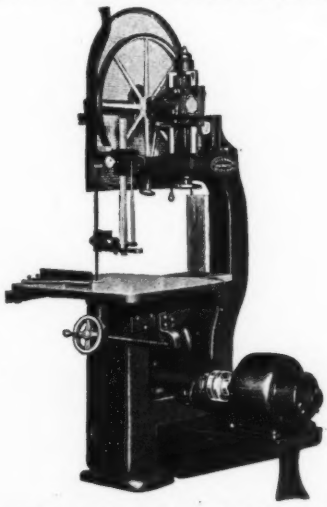


Descriptive catalogue and full particulars furnished upon request.

Industrial Education Department

THE JOHN STEPTOE CO.
CINCINNATI :: :: OHIO

NEW TYPE BANDSAWS

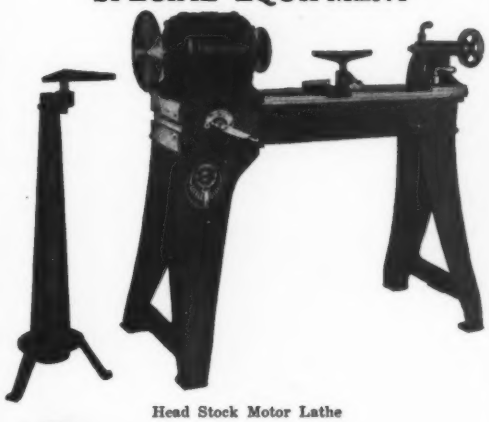


The New Model No. 185 and No. 186 Bandsaws represent the latest development in machines of this type. Built in two sizes, 30" and 36" wheels, with ball bearings or babbitted bearings, safety guards that are designed and built as a part of the machine, and can be furnished for belt or direct motor drive.

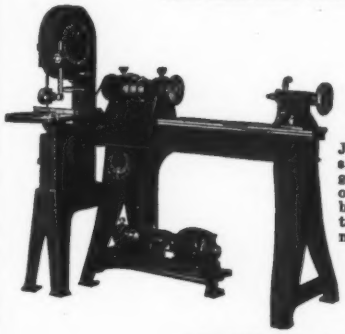
Write for literature describing these machines, also catalogue showing full line of wood working machinery for Manual Training Schools.

HALL & BROWN WOOD WORKING MACHINE CO.
Broadway, Tyler, Ninth Streets,
ST. LOUIS, U. S. A.

LITTLE GIANT
MANUAL TRAINING DEPARTMENT
SPECIAL EQUIPMENT

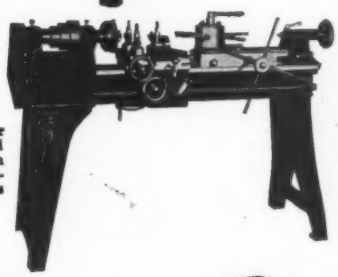


Head Stock Motor Lathe



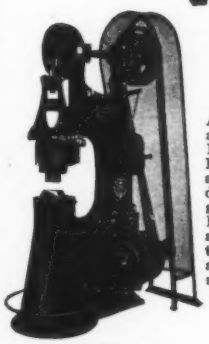
Combination Wood Lathe and Band Saw.

Jointer, planer, jig-saw, sander, buffer, grinder, mortiser and other equipment can be furnished and attached in a similar manner.



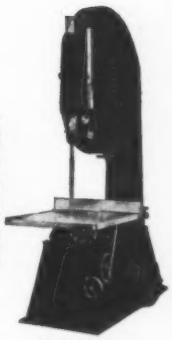
Metal Lathe—Motor or Belt Driven.

Miller, planer, gear cutter, grinder and other equipment can be furnished and attached the same as with wood lathe.



Power Hammer—Motor or Belt Driven.

All Little Giant Wood and Metal Working Equipment is sold on 30 days' trial, and guaranteed FOREVER against defective material and workmanship.



Band Saw—Motor or Belt Driven.

LITTLE GIANT COMPANY
Established 1876
223 Rock St. Mankato, Minn., U. S. A.

CLASSIFIED WANTS DEPARTMENT

The rate for classified advertisements is $.07 per word per insertion, payable in advance. All wants subject to approval. Minimum 25 words. Forms close on 5th of the month preceding date of issue. Write for discount on yearly insertions.

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Basketry Materials—We carry a complete line of basket making materials including Kindergarten reeds, all sizes, round and flat, in one pound packages. Our line includes raffia, French willows, straw braids, Hong Kong twisted grass, basket bases, rattans, chair cane, dyes, etc. The Jayson Company, Inc., 217 Mercer St., New York City.

Basketry Materials—We have everything for basket making, including reeds, willow, chair-cane, Indian splints, ash splints and wooden bases. Send Fifteen Cents for Samples, 65-page Catalogue and directions. This contains illustrations of over 500 baskets, trays, frames, etc., with suggestions as to making them. Lewis Stoughton Drake, Inc., 33 Everett St., Allston, Boston 34, Mass.

Everything for Elementary Handwork — Also for basketry, weaving, bookbinding and chair caning. Mounting boards, Walderaft dyes, crayons, burlap, scissors, punch and eye sets. Thomas Charlés Co., 2249 Calumet Ave., Chicago.

Basketry Material—Reed, Raffia, Bases, Pine Needles, Ash Splints, etc. Free Basketry Catalogues. J. L. Hammett Company, Cambridge, Mass.

BATIK

Manual Arts Supplies—Circular and straight knitters. Bookbinding Material, Bead Looms, Stencilling, Stick Printing and Batik Supplies, Wooden Napkin Rings, Plasticine, Flower Pot Moulds. Free Manual Arts Catalogues. J. L. Hammett Company, Cambridge, Mass.

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"Selective Book Service"—Books on Art, Lettering, Mechanical Drawing, Industrial Arts. Special service for teachers. Write for Catalog B. Milford Book Company, Milford, Conn.

BRUSH MAKING

Brush Making, the ideal subject for Special Schools and Manual Training work. Highly successful, wherever introduced. Send for 1924 illustrated pamphlet, listing various brushes of everyday use, with instructions how they are made. Magnus Brush Materials, 604 W. Lake St., Chicago.

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Cabinet Hardware and Upholstery Supplies for Manual Training. Latest period and mission pulls, costumer hooks, wood knobs, tea wagon wheels, electric cluster posts, cedar chest fittings, mirrors, wood dowels, Seng bed equipment. Complete line Stanley tools. Send for catalog. Ohio Vocational Supply Co., Wapakoneta, Ohio.

Special Service—We make it a rule to give special service on Cabinet Hardware for teachers. Send a postal today for our catalog. F. A. Rauch & Co., 410 S. Market St., Chicago, Ill. In one line of business for 41 years.

CANING

Finest Quality—We have cane, reed, webbing, flat rush, for all kinds of chair caning. Send Fifteen Cents for Samples, Directions and Catalogue. Louis Stoughton Drake, Inc., 33 Everett St., Allston, Boston 34, Mass.

CATALOGUE.

Manual Training Supplies—Catalogue Number Four effective October 1st. Contains unusual items, i. e., Tea Wagon Wheels; Glued Chest Cedar; Bridge Fixtures; Panels; Oak Table Tops; Cluster Lamp Stands; Silk Lamp Cord; Wire Lamp Frames. Free to schools. National Manual Training Supply Company, 322 S. 4th St., Minneapolis, Minn.

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Clock Movements—chimes, dials, part of cases in the knock down, blue prints, designs, instructions, in fact, all assistance required by manual training teachers. Write for free booklet today. American Clock Company, Nicetown, Philadelphia, Pa.

CUSHIONS

We supply teachers with upholstered cushions for any piece of furniture and also all kinds of upholstering supplies. Write for price list. The Dodge-Dickinson Co., Bloomington, Ill.

DRAFTING

Catalog G.—New illustrated catalog on Drawing Stands and Drafting Tables. Suitable for Schools, Drawing Classes, Artists, Draftsmen and Engineers. The Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass.

"CYMA" Mechanical Drawing Instruments. "All-in-one" compasses, combining Lead, Pen and Divider Points—$1.25. Ruling Pen with Lead-Holder—$.60. The two items in Leatherette Pocket—$2.00. Exclusive features and quality make them best adapted for school work. E. Bourquin, 1353 Main Street, Waltham, Mass.

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Want Good Electrical Projects? Build PEPCO Hot Pads or Toasters. Neat, simple, rugged, economical, satisfactory. We furnish instructions and parts. Service if desired. Address "PEPCO," Highland Park, Illinois.

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Engines—⅛ H. P. and up. Blueprints, Mechanical Books, Castings, Complete Engines, Gas, Gasoline and Steam, Small Boilers, Pumps and other Small Machinery. Send for catalogue, postpaid 20c (coin preferred) or stamps. Modern Engine & Supply Co., 334 Monadnock Block, Chicago, Ill.

Castings and Blue Print—½ H. P. Water Cooled Gas Engine. Write for prices and particulars to:—H. O. Dickert, 112 S. Washington Street, Ypsilanti, Michigan.

FIBRE CORD

See our full page advertisement regarding our complete Art-Fibre Weaving Service. Art-Fibre Cord, Stakes, Furniture Frames, Finishes, etc. Write for our catalog of designs. Grand Rapids Fibre Cord Company, Grand Rapids, Michigan.

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Judson T. Webb, formerly instructor in pottery at the Art Institute of Chicago, has located his laboratory and pottery supply business at 1710 W. 99th St., Chicago, Ill., Beverly Hills. He is prepared to furnish his glazes and colors, also clay, pottery tools and his potter's wheel. Send for new circulars. Judson T. Webb, 1710 W. 99th St., Chicago, Ill., Beverly Hills.

HANDCRAFT SUPPLIES

Basketry Materials—Reed, raffia, crepe paper rope, fibre cord. Flower materials—wires, leaves, crepe paper. Wax for Art Work. Gesso, Reliefo, Picture Placques, Boxes, Book Ends, and dozens of other things to decorate. Enamels for art work. Bronzing Powders. Mottoes to Color and Frame. Celluloid Novelties. Parchment lamp shades, designed and plain, and frames. Our "Manual for Handcrafters" is the most complete book of its kind published. Send for a copy. It's free. Danner's, 122 West Grand Avenue, Oklahoma City, Okla.

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NEWCOMB Automatic, Fly-Shuttle, Hand Looms for Educational, Vocational and Commercial Purposes. Write for Catalog—Newcomb Loom Co., 474 Taylor St., Davenport, Iowa.

Looms—Adapted for schools, hospitals and college use. Eureka rug filling, carpet warp, basket reeds. Send for catalog with price. The Reed Mfg. Co., Springfield, Ohio.

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Leather—We have a fine line of leather and imitation leather ready for immediate shipment. Write us your wants today. F. A. Rauch & Co., 410 S. Market St., Chicago, Ill. In one line of business for 41 years.

Leather for Bags, Cases, Pocketbooks, Fancy Leather Goods and Novelties. Wilder & Company, 226-228 W. Lake St., Chicago.

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739 Teachers Wanted who can demonstrate the Ames Lettering Instrument to their students. Free blue print and circular. O. A. Olson Mfg. Co., Ames, Iowa.

MODELING CLAYS

Modelling Materials—Plasticine, never hardens, Antiseptic, Ten Colors. Send for free sample. J. L. Hammett Company, Cambridge, Mass.

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Build Your Phonograph. Quality phonoparts. Famous Serenado Motors. Quality Serenado motors and motors of other types. Electric Motors, tonearms, reproducers, amplifiers, case material, accessories. Free, blueprints and building instructions. Big saving. Wonderful results. Prompt delivery. Schools given special consideration and aid in phonograph construction. Catalog mailed for ten cents. Hoosier Manufacturing & Supply Co., 312 Baldwin Block, Indianapolis, Indiana.

Build a genuine Choraleon Phonograph and save one-half. We furnish motors, tonearms, blue prints, instructions and parts. Send for catalogue and free blue print offer. Also full line Radio supplies, Radio cabinets. Veneer stock. Choraleon Phonograph & Radio Co., 1223—20th St., Elkhart, Ind.

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Free Samples—We will send you free samples of all our reeds and raffia for school use. Catalog and directions, 15 cents. Louis Stoughton Drake, Inc., 33 Everett St., Allston, Boston 34, Mass.

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We are cutters of stones interesting to jewelry workers. Assortments gladly sent on approval. Reasonable prices. George H. Marcher, 934 Santee St., Dept. A, Los Angeles, Calif.

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We have a wide variety of Tapestries and Velours, in all sizes, styles and designs. It will be a pleasure to send samples. Write us your wants. F. A. Rauch & Co., 410 S. Market St., Chicago, Ill. In one line of business for 41 years.

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FOR SALE:

6 Sheldon No. 1 wood lathes, 11"-26".
2 Sheldon No. 3 wood lathes, 11"-36".
48' 1½" leather belting.
1 5-H.P. Westinghouse motor, 1700 RPM.
10' 4½" leather belting.
1 16"-6" wood split pulley.
3 12"-4' 0" wood lathes with counter shafts, home made.
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22' 1' 4" steel shafting.
4 1¼" adjustable shaft hangers, 14"-16" drop.
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1 20"-6" wood split pulley.
6 7"-6" wood split pulleys.
14' 1½" leather belting.
38' 2½" leather belting.
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6 No. 02D Buffalo down draft forges with coal boxes and water tanks.
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We will sell all or any part of this equipment, as we wish to reduce the department in which it belongs to make room for other departmental equipment. Address Mr. L. H. Lehman, Supv. of Manual Training, Red Wing High School, Red Wing, Minn.

For Sale—Universal Woodworker, practically new. Has circle saw, jointer, band saw, mortiser and shaper attachments. Fifteen horse power A. C. Motor. Ideal for High School wood shop. Address M-8, Industrial-Arts Magazine, Milwaukee, Wis.

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Built with the same care and accuracy as a machine tool.

This machine is portable, motor driven, and can be run from either light or power circuit. Equipped throughout with ball bearings and has a capacity for the majority of band saw operations. These machines are particularly adapted for manual training work and are well guarded.

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and the most improved of all is Pease Equipment. The Pease Vertical and Sheet Washer is especially adapted for schools and is moderate in price. It turns out clean cut, thoroughly printed blue prints whether the sun shines or not.

We would like very much to tell you the complete Pease Vertical story. We will gladly tell you about our special school offer and give you a list of prominent school users.

Send for Pamphlet J-02, "Instructions for Making Blue Prints"

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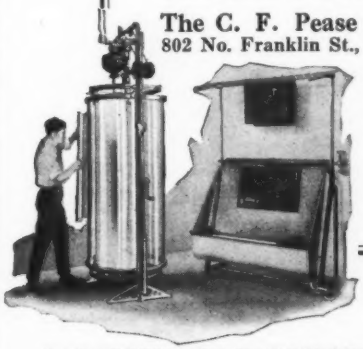
802 No. Franklin St., Chicago, Ill.



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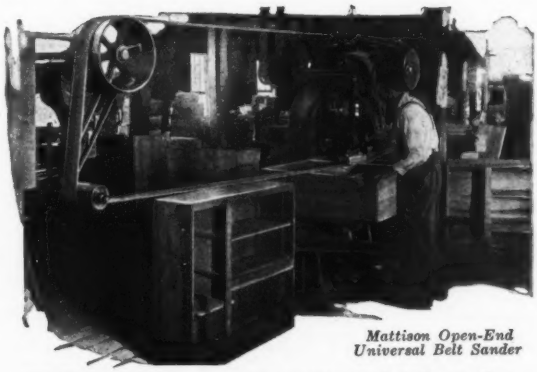
See Our Exhibit of Blue Printing Machinery and Drafting Room Supplies at the Midwest Vocational Education Convention, Hotel Chase, St. Louis, January 16th-19th.

Sanding Assembled Cabinets With Hand-Block Sander



Mattison Open-End Universal Belt Sander

BESIDES providing a genuine machine method for sanding built-up cases, moulded shapes, etc., this Universal Belt Sander will give your boys an opportunity to familiarize themselves with mechanical sanding methods as they actually exist in practically every woodworking factory. If your school shop is not equipped with a Hand Block Belt Sander, you should immediately investigate this machine. We build three different models.

Bulletin 134 shows dozens of interesting operations. Ask for it.

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Pivots to any angle. Dynamically balanced —Universal motor, operates on A. C. or D. C. Speed, 15,000 r.p.m.

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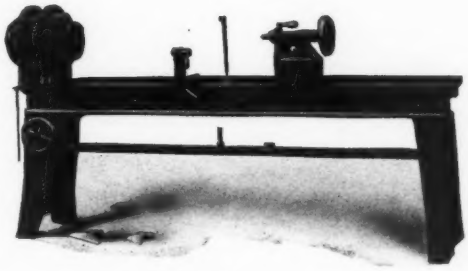
Woodworking Machinery

IMPROVED WOOD TURNING LATHES



No. 489-B 1-H. P. Multi-Speed Motor Head

Wood Turning Lathe for Vocational Schools and Factories

The Lathes are 20" Swing, of various Lengths, and Speeds are 600, 1200, 1800 and 3600 R. P. M. Regulated and Controlled by *Hand-Wheel* at front end. The Motor is 60 cycle, 2 or 3 phase and any voltage.

Other Sizes of *Motor-Head* and *Belt-Driven* Lathes Made.

H. B. Smith Machine Co.

Smithville, N. J., U. S. A.

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Soldering, Heat-Treating and Metal Melting

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The No. 8 Torch has a 25 lb. capacity melting pot for any soft metal. The Pot can be removed and Torch used for heating soldering coppers or preheating of any kind. The burner is adjustable or can be removed entirely from the stand and used as a hand torch.

The Blast Furnace Without A Blower.

This Combination Bench Furnace will handle the largest soldering irons, heat-treat any carbon steel tools or melt 25 lbs. of soft metal. Fitted with three Powerful Johnson Burners, which do not require any forced air blast or blower.

No. 118 Bench Furnace

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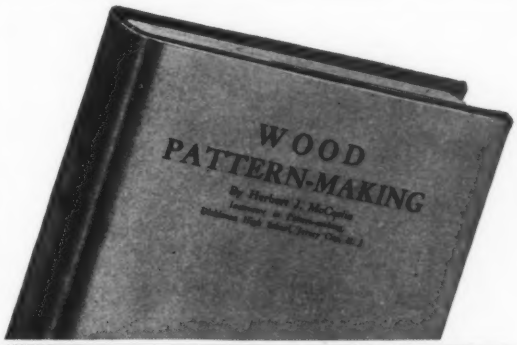

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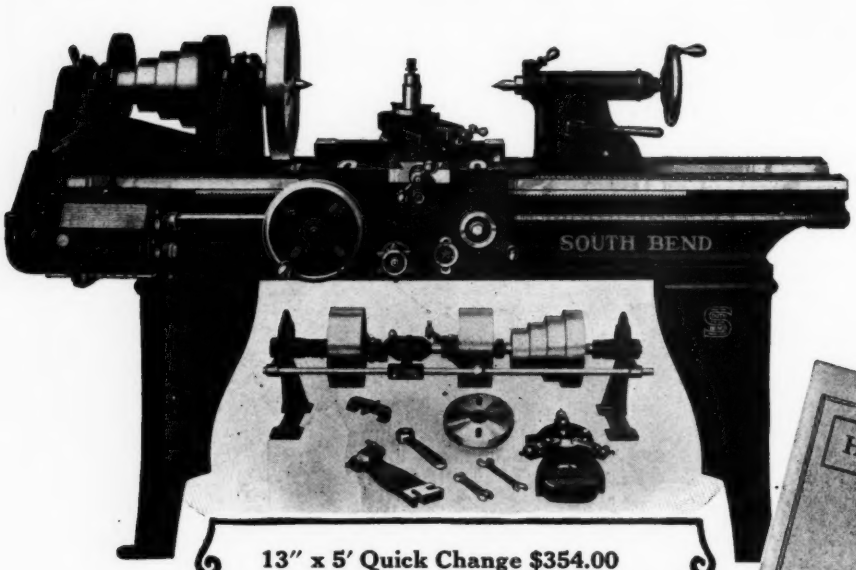

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FIG. 5. PORTION OF THE HOME MECHANICS SHOP AND CLASS AT WORK.

Home Mechanics Instruction at Stout

C. A. Bowman and F. E. Justison, Stout Institute, Menomonie, Wis.

IN the industrial teacher-training work carried on at Stout Institute a careful record is kept of the demands from the teacher market. The calls for teachers of industrial work are classified according to the combinations of work and the kinds of schools. A record is kept of the number of times that a given combination of work is called for in the requests for teachers, and this number is divided and put under the kinds of schools in which the combination is wanted. It has developed in the last two years that Stout Institute was called on for teachers to teach 84 different combinations of industrial or trade work. Many of these combinations were necessarily alike differing perhaps in one or two kinds of work. During the last few years in these calls for teachers, there has been a steady increase in requests for teachers to handle some form of general shop. There has seemed to be a trend in the direction of handling home mechanics in the shop that has one kind of general equipment.

In analyzing the market in the calls for general shop work, it has seemed that the type of work called for more than anything else has been home mechanics. This article is a description of the work which has been and is being done in connection with the training of home mechanics teachers now at Stout Institute.

At Stout Institute there are three groups of men taking teacher training. One group is made up of high school graduates taking the two-year industrial teacher-training course leading to a diploma. The second group is made up of high school graduates taking the four-year course leading to a degree of B. S. in industrial arts. The third group is made up of journeymen who take a two-year intensive teacher-training course fitting them to teach in vocational schools. Some of these men are also high school graduates and also work in either one of the first two groups. In the first-year work in the first two groups, beginning students are required to take a cycle of work in different shop and drawing courses representative of the combinations of work called for in

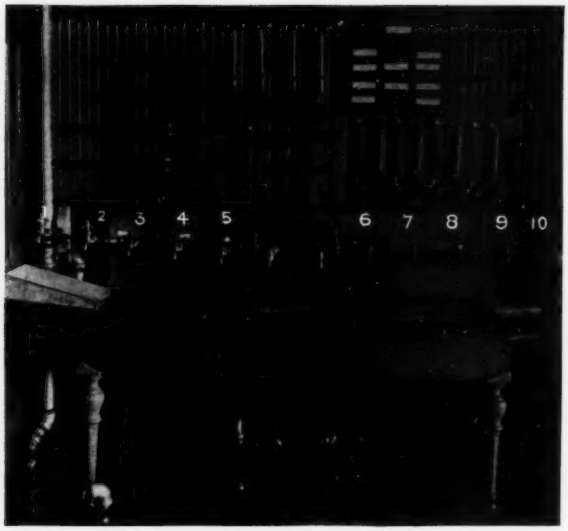


FIG. I. PLUMBING PANEL, SHOWING THE FAUCETS, TOOLS, TRAPS, ETC.

the present teacher market. In the second year, choices are made according to major and minor work for teacher preparation. These choices are made by the students, using the information gained in the several courses taken in the freshmen year, plus tabulations of the calls for teachers for the preceding two years showing what combinations of work are advisable for major and minor studies. For the home mechanics course for the student taking teacher training, the freshmen group of shop and drawing work is prerequisite. This gives him courses in the elements of the various kinds of work found in the home mechanics shop. The course which he himself takes in the home mechanics shop carries out typical projects that might be given in the course in home mechanics with studies on shop management in connection.

Home mechanics as a school course appears to be coming forward: first, as the small town's solution of the junior high school industrial-arts philosophy; second, as a means of providing shopwork for students in junior high schools in the larger cities not particularly in the industrial group; third, as one form of shop in which a variety of occupational work may be represented in the school in the larger city where it does not seem feasible to have a number of single activity shops; and fourth, it is being used in some places as the shopwork to give the part-time pupil in the vocational school who comes without any basis for intelligent choosing of occupational work. This latter use has evidently arisen because of the fact that boys are reaching the age of 14 and are going over to part-time attendance without an opportunity of really taking a junior high-school industrial arts course before the age of 14. Probably as the junior high schools are developed and as the industrial work in these schools gets closer to an operating basis giving pupils a real chance to study occupations, the necessity for home mechanics courses for the beginning part-time pupil will diminish. This is probably some time into the future.

In studying the implications in the various calls for teachers, it appears that home mechanics is coming to

FIG. II. THE HOME MECHANICS SHOP AT STOUT.

be interpreted as a course made up of a number of projects which are necessary in the mechanical maintenance of the modern home. In formulating the course these things which must be done in the mechanical maintenance of the home are classified by occupations, then from the total list of jobs or projects typical jobs are picked from the various occupations. When these are combined in the course in home mechanics, the course does two things. It gives a series of jobs that are of immediate practical application in the modern home; and second, it gives some opportunity for the pupil to work in jobs that are typical of present-day occupations. There is no dearth of work to do. It is a problem of good selection and good management to work out a course in home mechanics and to run it. It is probable that there will not be time in any school for putting a given group of pupils through a course of home mechanics projects which does more than involve a few of the things necessary in the mechanical maintenance of the modern home. This being the case, the selection of those things which are accomplished should be made with care so that the representative type jobs are as typical as can be found.

For the teacher who is working with a course in home mechanics certain items of specific information are needed, if the teacher appreciates the orientation of the course, its significance, its purposes and its values. The initial arrangement of a course in home mechanics will very likely immediately undergo changes. These changes will continue for some time. In many cities it will be necessary to take a wood shop and make such changes and additions in it as are necessary to carry on home mechanics work. As suggestive of the assignment given to teacher-training students, the following list of possible jobs indicates the kinds of work from which the projects are taken.

Woodwork.

Drive different nails straight.
Draw different nails.
Saw a board to measure.
Smooth and edge plane a board.
Drill small holes with hand drill.
Drive different screws straight.

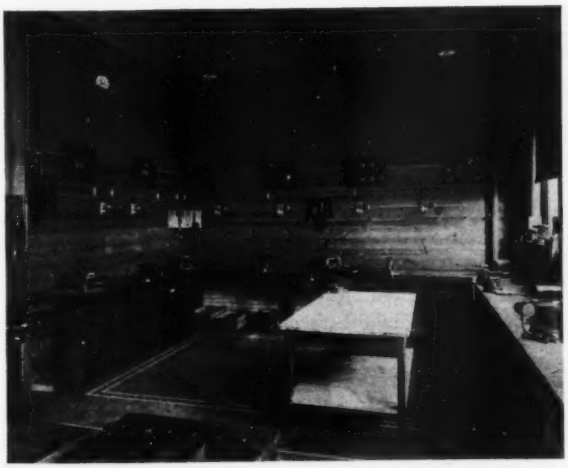


FIG. III. DEMONSTRATION CORNER, SHOWING ELECTRICAL PANELS AND OUTLETS.

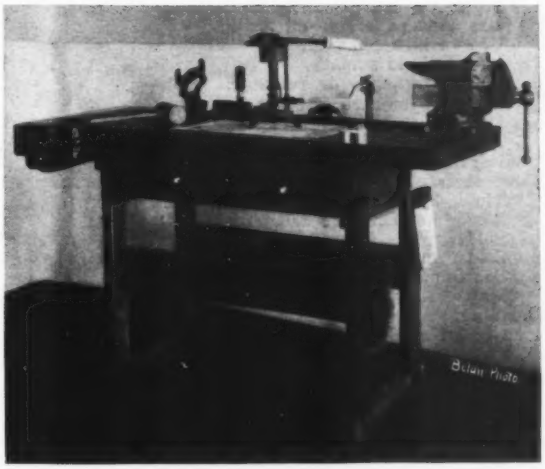


FIG. IV. TYPICAL BENCH EQUIPPED WITH TOOLS FOR HOME MECHANICS.

Learn sizes and kinds of nails and screws.
Hang curtain brackets.
Hang shade brackets.
Bore with auger bit.
Saw round hole with compass saw.
Make an ordinary box.
Make a tool box.
Use sand paper.
Put partitions in a drawer.
Make a knife and fork box.
Make a miter box.
Make a picture frame.
Make a screen to fit into a window.
Learn names of standard stock in frame of house.
Locate studding on plastered walls.
Make a wooden bracket for shelf.
Put up a shelf.
Set a flat hinge on a small door.
Set a cupboard latch.
Set a pair of butts.
Prepare hot glue.
Use cold and hot glue properly.

Furniture Repair.

Repair broken runner on chair.
Repair broken arm on chair.
Tighten loose joint on chair.
Re-cane a seat.

Sharpening Tools.

Sharpen a chisel and plane bit.
Sharpen an auger bit.
Sharpen a garden hoe or shovel.
Sharpen a pair of shears.
Sharpen a lawn mower.

Bench Metal.

Hack Saw and file a piece of iron stock to size.
Cut iron with cold chisel.
Drill in iron.
Make a rectangular hole in piece of iron.
Tap a small thread in piece of iron.
Make pipe drill for drilling brick.
Re-spring a door lock.
Reverse a mortise lock.
File a common key.
File a Yale key.
Make a knife.
Make a metal bracket for shelf.

Glazing and Painting.

Cut a pane of glass to size.
Make some putty.
Re-work old putty.
Putty nail holes in a board.
Glaze in a window pane.
Set in a pane with wooden strips.
Apply shellac to a board.
Apply flat paint.
Use sand paper between coats of finish.
Apply enamel.
Stain and fill a board.

Varnish a board.
Use sand paper on old finish.
Use varnish remover.
Re-finish old surface.
Re-bronze pipes or radiator.
Take proper care of brushes.
Mix and use whitewash.
Apply kalsomine.
Repair holes in plastering.

Sheet Metal.
Tin a soldering copper.
Solder holes in a piece of tin plate.
Solder joints in pieces of tin plate.
Solder household utensils.
Set tinners' rivets.
Make cooky cutter.

Plumbing.
Cut off a piece of pipe with hack saw.
Cut off a piece of pipe with pipe cutter.
Use burring reamer on pipe.
Thread a piece of pipe.
File a battered thread.
Connect two pieces of pipe.
Learn names of common pipe fittings.
Assemble groups of common pipe fittings, using Stillson wrench.
Trace back water line and cut off at valve.
Re-washer compression faucet.
Re-washer fuller faucet.
Re-washer quick compression faucet.
Re-washer fuller bath cock.
Re-washer automatic faucet.
Re-washer ball cock in closet tank.
Renew tank ball in closet tank.
Clean out a sink trap.
Clean out a floor trap.
Use plumber's friend in sink and closet.

Electrical.
Make liquid cell.
Make dry cell.
Make splice in wire.
Make branch tap in wire.
Solder a connection.
Make an electro magnet.
Connect one push button, one bell and one battery.
Connect one push button, two bells and one battery.
Connect two push buttons, one bell, one buzzer and one battery.
Adjust breaker points in a bell or buzzer.
Wire one switch to operate one lamp.
Wire two 3-way switches to operate one lamp.
Install a bell ringing transformer to operate electric bells.
Wire a lamp socket.
Wire different attachment plugs.
Wire a small lamp.
Make a heating element.
Locate a burned out fuse.
Refill a burned out fuse.
Learn principal rules for electric wiring.
Assemble parts of conduit system.

Miscellaneous.
Rivet leather strap.
Sew leather and canvass.
Half-sole a pair of shoes.
Mend puncture in inner tube.
Repair garden hose.
Replace broken handle in garden tool.
Read gas, water and electric meters.
Mix cement and sand to make concrete.
Mix cement, sand and gravel to make concrete.
Regulate mixer on a gas burner.
Fire the furnace properly.
Read dimensions from blue prints.

Figures VI and VII are suggestive graphic layouts to assist in checking a course in home mechanics against the total breadth of probable work.

The occupations represented in the course should be kept clearly in mind when fitting up the shop. That portion of the occupation most frequently found in the mechanical maintenance of the home will probably receive first attention. If some sheet metal is to be taught, furnaces must be supplied for heating the soldering copper. If bench metal is to be taught, metal-worker's vises must be installed to take care of this. Faucet repair might be carried on without water connection, but the instruction would not be so vivid.

Three probable avenues open for taking care of the work shop: first, remodeling and refitting a wood shop; second, using an existing wood shop with the addition of a minimum amount of equipment; third, building and equipping an entirely new shop. Figure VIII indicates the floor plan of a room formerly used as a school kitchen, remodeled for home mechanics.

The first method will be the one most likely to be followed. Circumstances in the ordinary case will necessitate this. This was done at Stout Institute during the first installation of the course. Three rooms were available and when considering the content of the course a former school cooking laboratory was selected. Gas, water and sewerage outlets were made use of to connect furnaces, water lines and drain pipes. Two sinks with large drain boards and a lavatory made excellent facilities for faucet connection and problems involving traps. The cut of a plumbing panel shows one of these sinks with the numerous faucets attached. (See Figure I.) These faucets are of the compression type; common compression on the right and quick and automatic compression on the left. The second sink, a duplicate of this, takes care of the fuller faucets together with a compression bath cock and a fuller bath cock. Room facilities such as above meant quite a saving in time, labor and cost.

A remodeled woodworking shop will answer the purpose since carpentry is one of the occupations represented. Since the general plan of instruction is to have different kinds of work going on at the same time, part of the benches may be removed leaving only enough to take care of the group planned for woodwork. This will leave space for the installation of a general metal working bench and possibly a bench for electrical work. If properly planned the two can be combined in one. This general bench can be placed along any wall with the minimum use of space. In our own shop we have such a bench 60′ long and 24″ wide. (See Figure II.) It occupies virtually nothing but wall space giving bench room without reducing floor space where needed for pupil use. If windows or other openings do not prevent, the wall back of the bench can be used for electrical panels where all electrical exercises can be mounted. These panels can be of soft unfinished lumber so that the electrical equipment can be readily attached in numerous hook-ups. Metal working vises and gas furnaces are mounted on this bench. Cabinets can be built underneath to take care of the numerous supplies and equipment for the shop. Typical groups of these would be paints and brushes, window sash and glass, sand and cement, woodworking stock and plumbing fittings.

The one tool that changes the woodworking shop into the home mechanics shop, is the metal vise. The variety of work to be done on the automobile has

brought on the market the combination, or auto, vise. The anvil, the common vise and the pipe vise are all combined in this one tool. The size with the 3½" jaw seems suitable for all problems and jobs. We have one vise of the 4" size but its bulk is not necessary to take care of the typical home mechanics problem. Stout Institute has had several inquiries concerning vises and our advice has been as above. It might be added that shortly after our shop was equipped several other shops in the institution requisitioned for such a tool to be installed for use in connection with maintenance. The head janitor stated it was just what he needed for general repair.

The gas furnaces should be of the bunsen or blast burner type so that a concentrated flame can be secured. It will heat the copper quicker and give a higher temperature when desired. A pilot light is of great convenience. It saves gas and lessens the danger of burning the tin from the copper. Safety gas lighters should be supplied with each furnace as matches are out of place especially in a shop where any woodwork is carried on. If any forging or heat treating is desired it can be done successfully with the blast burner. The anvil of the vise and the blast burner supplies the necessary equipment to do light forging. Many practical problems can be worked out even in the home mechanics shop. The making of a screw driver was a job that the boys in a grade practice class enjoyed. The variety of work done here is significant. The handle was in woodwork, the ferrule in bench metal work, and the blade in forging.

Panels for taking care of tools and demonstration equipment should be provided where wall space is available. Besides needed tools these panels may well contain some hook-ups and typical materials. It might be well to have the tools of each occupational group separate should space permit. The advantage of this is several fold. It supplies order and system to the shop and gives to the boy a definite idea concerning tools used and things done in that occupation. Figure I shows a plumbing panel above a bank of faucets. This space could hardly have been used in any better manner.

Outlets on the 110 volt alternating current circuit should be provided where the electrical work is carried on. It might be well to have each outlet separately fused so that short circuits or over-loads would not cut out the main line. On wall panels open work wiring can be installed and the ordinary entrance switch attached to the circuit. (See Figure III.) A conduit job with special fittings would be much more expensive and probably not so well adapted for instructional purposes. In our own shop an ordinary cleat receptacle is also provided with each switch. This provides attachment for the ordinary plug in the testing of lamps, lamp cords, flat iron cords, feed-through switches and other electrical appliances. This receptacle can also be connected so that the one set of fuses protects both circuits. It is best to supply refillable fuses here. After instruction in locating a blown fuse and replacing same, the boy repairs his own circuit when trouble of any kind cuts off the current. This is a good practice for him. We use the H. and L. refillable type. This can be obtained up to thirty amperes capacity. Where direct current and alternating current are both available they can be supplied alternately to the outlets by means of a double pole, double throw switch. The direct current would be necessary for any work in storage batteries.

Some kind of a grinder is necessary. The ideal tool would be a home motor with grinder and buffer attached. The stone should grind knives, chisels, screw drivers and plane bits. A chuck for small bits that could be quickly attached would be a valuable accessory. The motor proper could be used for instructional purposes concerning the upkeep of the motor in the home.

Where necessity requires, an existing woodworking shop can be used successfully to teach the subject and it will require a minimum amount of additional equipment. This method still keeps the shop available for classes in woodwork. The metal vise can be mounted on the woodworking bench on the corner opposite the wood vise. A gas connection can be run to the back of the bench terminating with a hose cock. When soldering or heating is to be done the burner is attached temporarily with the hose connection. A piece of sheet metal or wooden covering can be used for protection against hot solder. A wooden covering would serve two purposes. It would also supply a mounting board for electrical hook-ups where wall panels were not available. This mounting board might be pocketed as a drawer underneath the bench, or if drawers fill the space, hung at the back. Figure IV shows a bench equipped with the burner and vise. Figure V shows the distribution of benches in the shop. Note the tinner's mallet instead of the regular woodworking mallet. It serves not only as a woodworking mallet, but in the forming of cooky cutters and like problems, it makes a suitable stake. An electrical outlet can be installed underneath the bench. If this is not possible one can plug into the lighting circuit which is usually supplied from the ceiling. This enables all the electrical problems to be worked out at each individual bench. Faucets can be taken care of at the sink that is usually found in every shop.

The following list of equipment and supplies is made for determining approximate costs and amounts. Where the existing woodworking equipment differs from that suggested in the list, corresponding changes may be made. Standard supplies likely to be found in any shop are sometimes omitted. For an original installation we feel the list quite complete as at least 95 per cent of it was made use of during the first two quarters of instruction.

Woodworking.

Articles	Approximate Unit Cost
Woodworking bench and vise	$22.00
Back saws, 12"	2.20
Panel saws, 18"	1.85
Screw drivers, Hurwood 5"	.36

Screw drivers, Hurwood 10"	.75
Screw drivers, bits assorted	.20
Gauges, box wood	.55
Try squares, 8"	.65
Hammers, claw 13 oz	1.00
Oil stones, India	1.20
Oil stones, Arkansas	2.80
Key hole saw, nest	1.44
Rip saw, 26"	2.60
Cross cut saw, 24"	2.30
Nail sets	.12
Counter sinks, wood and metal	.35
Clamps, C 6"	1.20
Clamps, Jorgensen, 12"	1.45
Clamps, Hargraves, 3'	1.90
Braces	3.12
Chisels, 1"	1.25
Chisels, ¼"	.85
Chisels, set	6.68
Jack planes	3.20
Carpenter squares	2.75
Bevel squares	.80
Dividers	.70
Glue pot, electric automatic	30.00
Extra pot, aluminum	4.00
Rules, 24"	.40
Scrapers, cabinet	1.30
Counter brushes	.45
Expansive bit	1.60
Auger bit set	4.28
Separate bits	.50
Plane irons	.77
Yankee screw driver	2.69
Yankee automatic drill	1.75
Casters, set	.10
Friction catches	.02
Hinges, butterfly, pair	.12
Butts, steel, pair	.05
Cupboard turns	.16
Hinge hasps	.14
Files, cabinet, 10"	.25
Files, rasps, 10"	.25
Files, auger bit	.17
Corrugated fasteners, per 1,000	1.00
Shelf supports, for ¼" hole, per gross	.65
Rubber tips, ¾", per gross	2.13
Screw eyes, per gross	1.00
Screw hooks, per gross	1.00
Wire cloth, black, 100 sq. ft	3.20
Liquid glue, ½ pint	.25
Cane, medium, per 1,000 ft	.90

Bench Metal.

Articles	Approximate Unit Cost
Vise, combination, 3½"	$11.70
Vise, combination, 4"	13.60
Extra pipe jaws	1.65
Monkey wrench, 10"	.90
End wrench, assorted	.35
Tap wrench, small	.75
Stove bolt taps, ¼"	.30
Center punch	.25
Hammers, ball pein, 13 oz	.80
Drill set, metal	3.40
Bench drill, ½" bit	20.00
Hand drill	3.75
Hack saw	1.00
Bolt clipper	4.75
Lock set, mortise	.80
Blank keys	.10
Lock spring, 3' coil	.15

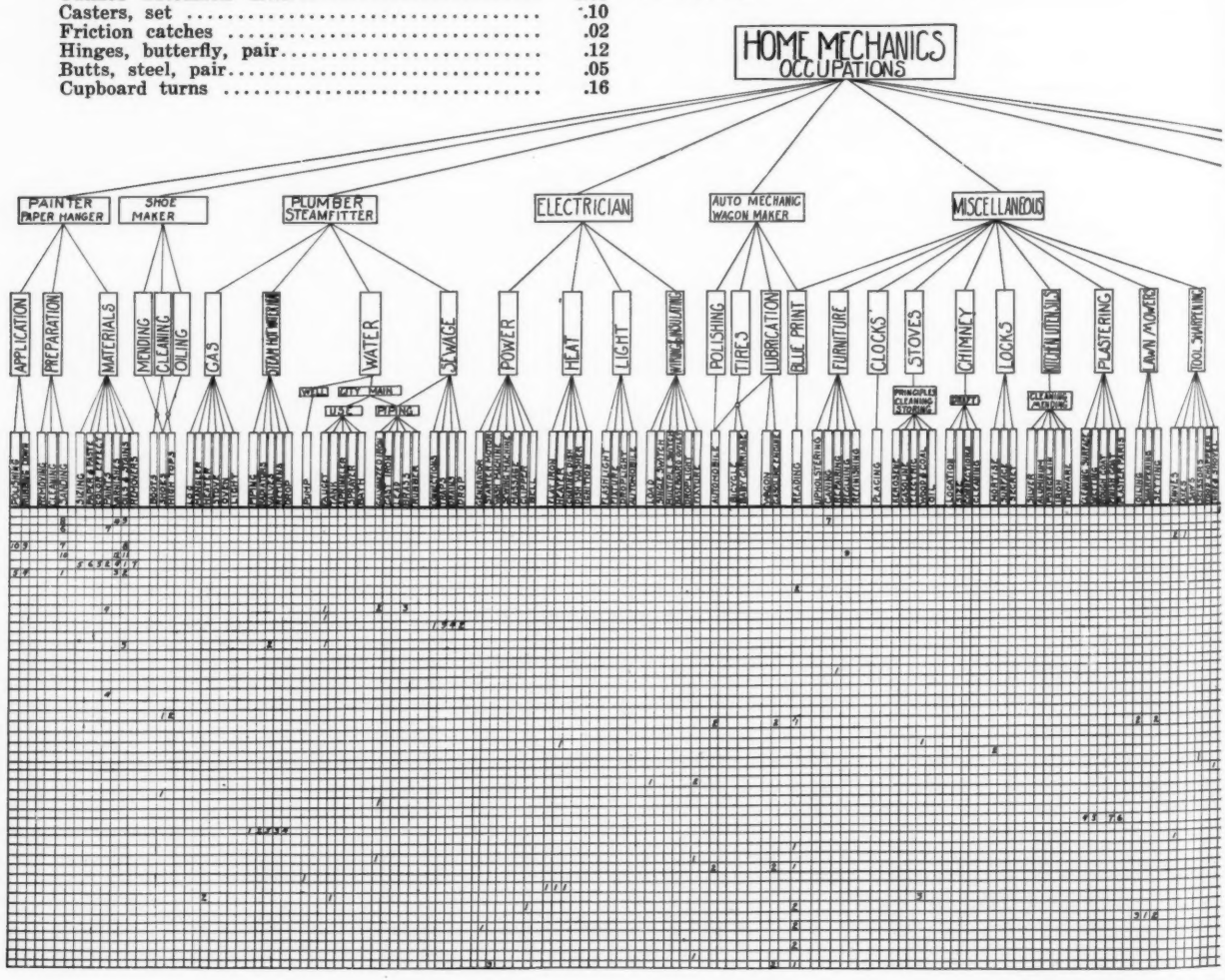


FIG. VI. JOB ANALYSIS

Yale night latch	3.90
Yale blank keys	.10
Oil can, one gal	.50
Oilers, one pint	.25
Files, mill bastard, 10″	.17
Files, bastard, flat, 10″	.20
Files, bastard, square, 8″	.16
Files, bastard, round, 8″	.13
Files, Warding, bastard, 4″	.20
Stove bolts, per 100	.40
Machine screws, 6-32, 8-32, 10-32, per gross	1.50
Hexagonal nuts, 6-32, 8-32, 10-32, per gross	1.05
Drill rod, per lb	.80
Bit stock, square shank, ⅛″ to ¼″	.12
Brass tubing $\frac{1}{8}$″	.40
Brass tubing, $\frac{7}{16}$″	.20
Carborundum dust, per pound	.50
Machine screw die stock, small	1.80
Machine screw dies, up to 14-20	.50

Glazing.

Articles	Approximate Unit Cost
Putty knives	$ .35
Box glass, 10″x12″	5.40
Glazier points, per pound	.50
Whiting, per pound	.04
Glass cutters	.15

Sheet Metal.

Articles	Approximate Unit Cost
Gas furnace, one burner	$ 9.00
Gas furnace, two burners	11.70
Tinners snips	1.60
Tinners snips, curved	3.35
Tinners snips, hawk bill	2.67
Soldering coppers, 2 pound pair	1.40
Soldering copper handles	.06
Mallets, tinners	.27
Soldering set	1.00

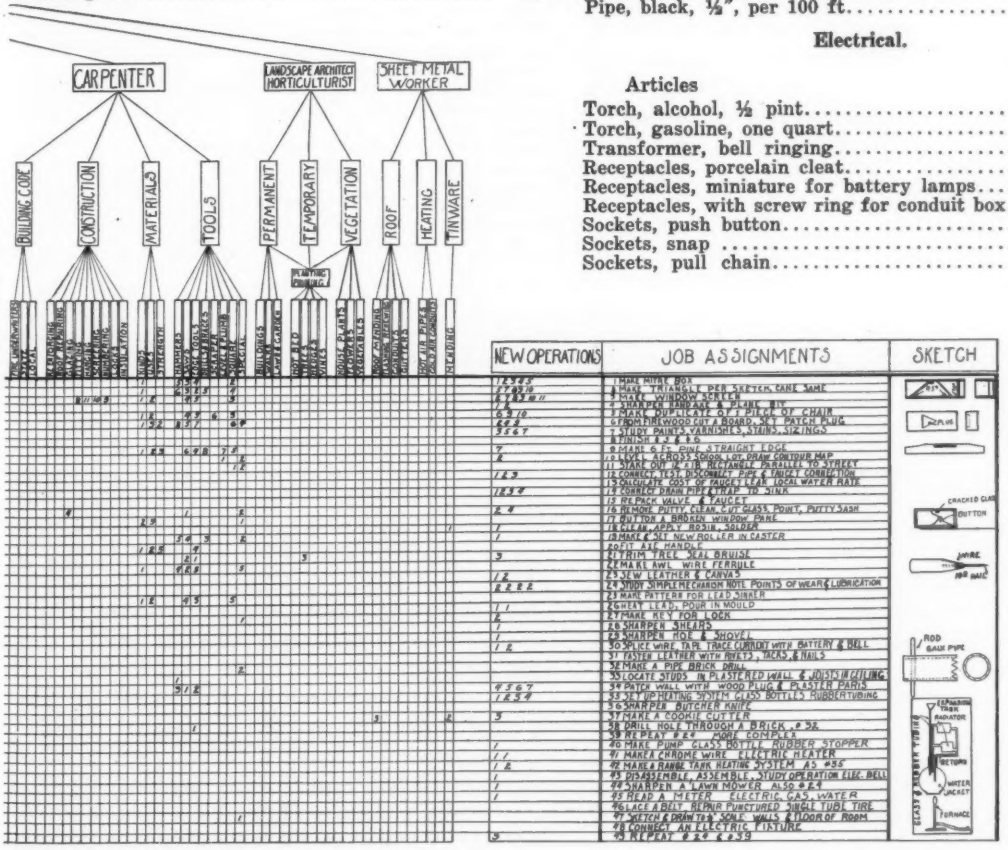
Gas lighters	.40
Tips for lighters	.15
Stop cocks	.45
Hollow punches	.95
Tinners rivets, per 1000	.30
Tinners rivet sets and headers	1.00
Solder, bar, per pound	.30
Soldering salts, per pound	.70
Tin plate, 20x28—I. C.—112 sheets	16.50
Tin plate, 20x28—Ixx—56 sheets	11.25

Plumbing.

Articles	Approximate Unit Cost
Stillson wrench, 8″	$ 1.00
Stock and die, ⅛″ to ½″	4.95
Stock and die, Beaverette, ⅛″ to ¾″	12.00
Pipe cutters, Saunders	1.40
Reamer	1.35
Faucets, compression	.60
Faucets, quick compression	.60
Faucets, self closing	2.40
Faucets, fuller ball	.40
Bath cock, fuller	2.85
Bath cock, quick compression	3.35
Ball cock	1.10
Bibb dresser	2.00
Compression washers	.01
Ball cock washers	.01
Fuller balls	.01
Ball cock seats	.10
Closet tank, low down	10.40
Copper floats	.35
Tank Balls	1.56
Bell Trap	.49
Floor drain and clean out	2.00
Gate valves, ¾″	.95
Plumber's friend	.60
Plumbing fittings (average per fitting)	.10
Pipe, black, ¾″, per 100 ft	3.30
Pipe, black, ½″, per 100 ft	4.20

Electrical.

Articles	Approximate Unit Cost
Torch, alcohol, ½ pint	$ 1.20
Torch, gasoline, one quart	7.80
Transformer, bell ringing	1.15
Receptacles, porcelain cleat	.12
Receptacles, miniature for battery lamps	.11
Receptacles, with screw ring for conduit box	.12
Sockets, push button	.30
Sockets, snap	.22
Sockets, pull chain	.40



SHEET FOR HOME MECHANICS.

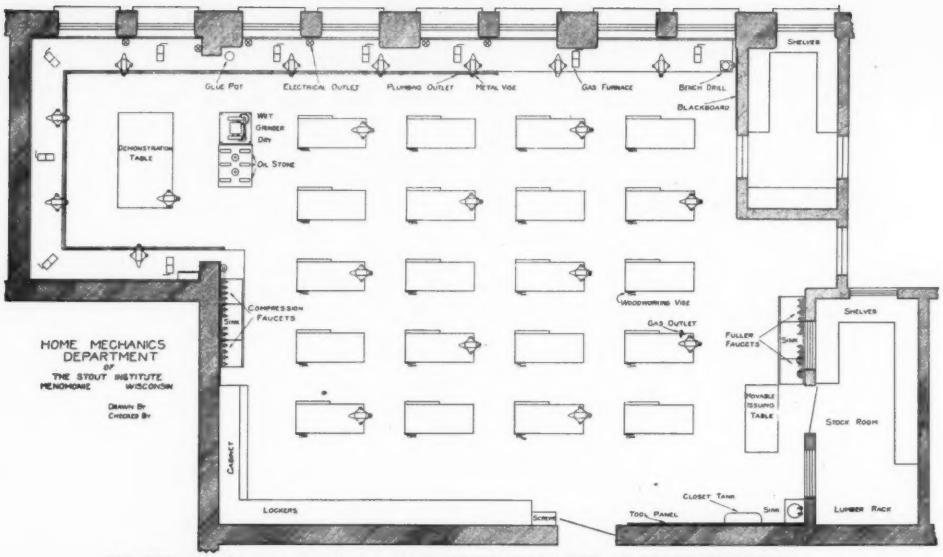


FIG. VII. FLOOR PLAN OF THE HOME MECHANICS SHOP AT STOUT INSTITUTE.

Benjamin cluster, for stand lamp	2.00	Conduit box covers, closed	.05
Flanges, ⅛", for stand lamp	.09	Conduit box covers, open	.08
Bells	.60	Condulettes, ½"	.25
Buzzers	.50	Conduit elbows, ½"	.14
Push buttons, battery	.06	Conduit, black, ½", per 100 ft	7.72
Entrance switches	.40	Annunciator wire, No. 18, per pound	.40
Fuses, H. & L. Refillable	.20	Magnet wire, D. C. C. No. 24, per pound	.75
Snap switches, surface—single pole	.25	Magnet wire, D. C. C. No. 32, per pound	1.95
Snap switches, surface—three point	.50	Wire solder, per pound	.30
Attachment plugs, swivel	.14	Friction tape, per pound	.45
Attachment plugs, separable	.15	Rubber tape, per pound	.45
Detachable composition plugs	.35	Fuse wire, per pound	1.00
"Plug all" attachment plugs	.50	Heating element wire, per pound	2.00
Feed thru switches	.40	Soldering paste, 2 oz. tins	.15
Benjamin "tap lite"	.60	Lamps, carbon, 110 volt, 30 watt	.22
Benjamin "tap lite" adaptors	.20	Lamps, carbon, 110 volt, 60 watt	.22
Lamp cord, No. 18, per 100 ft	2.20	Lamps, carbon, 110 volt, 120 watt	.30
Heater cord, No. 16, per 100 ft	8.00	Lamps, battery, 1½ volts	.14
No. 14 Rubber covered wire N. E. C., per 100 ft	.80	Lamps, battery 6 volts	.14
Socket bushings, ⅛" per 100	.40	Asbestos slate, ⅛" per sq. ft	.20
Lock nuts, ½" per 100	.70	Demonstration battery jars	.75
Bushings, ½", per 100	1.60	Screw drivers, small	.25
Insulated staples, per 100	.15	Pliers, combination	.60
Conduit boxes, ½"	.15	Car bits, ⅜"	.50

The Newspaper Men of the Night

Robert F. Salade.

IN every town and city of the civilized world are branches of a peculiar society of specially trained workers who labor through the long, dark hours of night that the people of the world may know what is happening in the world. These workers enjoy but little of the ordinary pleasures of life; they seldom take an active part in the everyday social affairs of their respective communities; they rarely have an opportunity to spend even a quiet evening at home. Nevertheless, the members of this unique association are always several hours ahead of other folks in their general knowledge of local as well as international events.

Several hours before the public reads in the early morning papers the particulars of some appalling sea diseaster—like that of the ill-fated Titanic, for example—these active workers, through the miracle of telephony, telegraphy and wireless telegraphy, have been in full possession of the facts. When a terrible conflagration is wiping out portions of a big city during the small hours of a newly-born day, and while the great majority of citizens are sound asleep, members of that peculiar society—the Newspaper Men of the Night—are preparing "copy," and are putting a complete account of the raging fire into type.

As the average person sits down at the breakfast table and leisurely glances over the pages of a favorite morning newspaper, scarcely a thought is devoted to the wondrous work which has been necessary to produce that neatly folded piece of printed matter. To make possible the production of a great morning newspaper, foreign correspondents have braved the dangers of the

jungle for an important news item; war journalists have approached the very firing line of fighting armies to obtain a few paragraphs of war notes; special correspondents have, perhaps, dropped photographs of great news value on fast ocean steamers by means of airplanes; regular city reporters have worked day and night on local notes. To complete this extraordinary work, night editors, journalists, "re-write" men; and, last but not least, the printers, have labored at the cost of their health and strength. Result: An extremely interesting daily newspaper containing authentic records of the previous day's pleasures, strife and struggles throughout the world, and for a copy of this journal the reader pays but a couple of pennies!

In the twilight of evening when the workers in most other crafts are leaving labor for the day, and are on the way homeward in multitudes, the newspaper men of the night are just leaving their homes for work. The thousands of day-workers soon disappear, and as the red sun sinks in the west, the thorofares of the city become more quiet and restful. Before the newspaper men reach their places of employment the streets and avenues are sparkling with countless electric lights. On every side are signs of the evening's offering of recreation and pleasure; the "bright lights" flash invitingly, but none of this is for the newspaper men of the night. They have already spent their "evening," or rather they have tried hard to turn the daytime into evening, with but poor success.

Seldom are the newspaper night workers late in arriving at the scene of their labor. Often during the day their slumber has been disturbed by the noise of the city's industrial activities. Bumping trolley cars, heavy motor trucks and tooting locomotives have no consideration for the man who must sleep in daytime. Even the home seems to be exceedingly noisy. Much too soon the average night worker is forced to leave his bed, after having made many attempts to gain the proper amount of repose. Heavy-eyed, the newspaper men of the night hurry into the plant, glad to begin their various tasks, and thus forget restless attempts for rest. Under the excitement of the fascinating work the care-worn faces of the men soon brighten; the dull eyes begin to glow.

By seven or eight o'clock in the evening copy is coming into the composing-room at a lively rate. The clicking of the keys of the composing machines becomes as music to the ears of the workers. Other pleasant sounds are the frequent rings of telephone bells and the "tap, tap, tap" of telegraph instruments. Speed acts as a stimulant, and by nine o'clock the men are wide awake and as happy as a crowd of children. "Hurry, hurry, hurry!" is the constant song from the battery of typesetting machines. Headache and eye-strain, (so prevalent among night workers) are by this time forgotten. This is the chosen life of the newspaper men. The greater number of them would not exchange this profession for some other where the opportunity offered. Most newspaper workers remain in the service until the call of the Grim Reaper.

What a wonderful scene of activity is presented in the editorial departments and composing-rooms of a great daily newspaper nightly between the hours of nine and ten o'clock. Here the workers cannot take things easy in their different occupations. How they run and rush about! It seems remarkable that they do not often collide with one another and make but poor showing with their handiwork.

Much of the department store display advertising which has been started by the printers on the "day-side" remains to be completed by the night men, and there is a great deal of other kinds of advertising matter that must be set up during the night. This display advertising is just as important in the construction of a modern morning paper as the general news stories. It is the big display advertisements in the newspaper that makes possible the production of such a journal at the modest cost of two cents per copy. And, it is the full-page and "double-spread" display advertisements in the newspapers of the populous cities that every day call hundreds of thousands of buyers to the shopping districts. The late John Wanamaker more than once said that the success of his famous department stores was due in large measure to newspaper advertising,

So, while it is true that the newspaper men of the day force on a metropolitan morning paper work hard at the composition of display matter, news items, and feature articles, it is during the late hours of night when the real struggle against time occurs. Then come the final corrections and changes for the display advertisements which must be published in the first edition. The many galleys of classified advertisements have to be placed in their proper positions. Headlines are to be set up for the prominent news stories. Additional pieces of copy are continually being rushed to the machines.

It is generally during the night time when the most thrilling news stories come along, and they usually arrive at moments when the composing-room is overtaxed with other work. Between the hours of eleven and twelve the cop conveyors fly back and forth overhead like a flock of early-spring swallows. The editorial department resembles a bee-hive. Reporters pound away on their typewriters. Every man in the place is working to his full capacity.

Out-of-doors can be seen the brilliantly illuminated streets, and the crowds from the theatres are strolling along with no thought for the busy scene inside the newspaper plant. Gentlemen in evening dress are escorting their ladies to the line of waiting automobiles. The laughter of care-free people rings out pleasantly, and above all can be heard the shrill crys of newsboys announcing an early edition of the morning paper. It is a world of pleasure just outside the windows of that newspaper building, but through it all the newspaper

men labor on steadily, for outside attractions are not for them this night, as they must put out the news!

Faster and still faster work the newspaper men as copy boys speed about and as reporters bustle in with eleventh-hour manuscript. Something of particular importance has happened. Here comes the managing editor himself rushing into the composing-room with copy telling about a big fire that has just broken out in the business block directly across from the newspaper building. The ruddy glow of the leaping flames illuminate the composing-room far better than the blue-white light from the arc lamps overhead! The light becomes a brighter red. For a few moments the clangor of the fire-engine bells drowns the clatter of the typesetting machines. The shrieks of a siren add to the din outside. But, there is no time for anyone in the composing-room to even look out of the windows. The complete account of that blaze, which will be read by several hundred thousand persons on the following morning, must go into type!

After the story of the fire has been disposed of, and as the fire has been brought under control, comes a comparatively quiet spell in the composing-room for a few moments at least. The silvery bell in the city hall tower is heard to chime the hour of one. Then suddenly in rushes the managing editor again fairly screaming: "Kill, kill, pages one, two and three! An earthquake has destroyed the greater part of the city of X———, and the full story must go into the next edition!" With surprising knowledge of all the work so far accomplished, the editor rapidly shows the make-up men what hold-over matter to save from the condemned pages. The less important news items, already in type, are simply cast aside for the melting pot.

Before the announcement of this latest disaster, the newspaper men had been working hard, indeed, but now they have to slave. Collars and ties are ripped from perspiring necks as they start work on the new copy, which is sent to the machines piece by piece. Almost like magic the bare news of the telegraph dispatches are copied and special writers are digging out facts about the population, the industries, the commerce and the history of the doomed city from the library of the editorial office. The linotypes are turning the account of the disaster into type slugs so fast that the falling of the matrices from the magazines seems like the patter of rain. The make-up men are handling the newly cast lines of type almost as fast as they come from the machines. Galley after galley of straight reading matter is produced with astonishing rapidity.

Another stirring scene is staged in the photo-engraving department, the blue light from the powerful arc lamps adding a "ghostly" color effect to the setting. Half tone plates showing views of the principal buildings in the stricken city must be made for the paper within an hour's time. The orginial of each picture to be reproduced is placed before a big camera, and the camera focussed until the proper size image shows on the ground glass. The plates are then developed, and finally the engraved plates are made. As the columns of type matter are ready to be made up into pages, the finished photo-engravings are received from the blocking room in the form of printing plates.

Despite the strenuous task and the extreme excitement, the newspaper men have been under perfect discipline, and like well-trained soldiers they perform their various duties in a most efficient manner. Every man in a big newspaper plant exactly knows his place. There are few wasted footsteps. Every motion is made deftly and surely to accomplish some important part of the work in hand. So quickly are the forms put together that to an inexperienced person it may appear as though the type-lines simply leap into their proper positions.

The excellent order is what attains the marvelous results in such a brief period of time. Trained men have been setting and arranging the headlines, sub-headings, legends for illustrations, etc., while the plain matter composition is being set on the machines; skilled make-up men place the columns of matter, printing plates, and spacing material in the right positions inside of the steel chases; a number of men are working on corrections. In this way the pages are systematically made up to standard sizes.

As each page is locked up no time is lost in "shooting" it to the sterotype department. The form is slid from the steel top of the make-up table to the steel top of a form truck; the form truck is then wheeled to the stereotype room where the page of type matter is pushed off of the truck onto the bed of the matrix-rolling machine. Now comes another battle against time.

The stereotypers are among the most speedy workers in a newspaper plant. The stereotyping department is a hot place; some of the men are shirtless, their muscular forms gleaming with perspiration, and as they run about the room they suggest a scene from "Dante's Inferno." The papier-maché matrix is rolled upon the face of each form of type; the "mats" while on their forms are baked on the steam-heated matrix drying tables; the curved stereotype plates are cast from the papier-maché molds; and after the curved plates have been correctly trimmed and finished, they are ready for the mammoth newspaper presses. In a modern newspaper plant the work of stereotyping is done so rapidly that the printed papers are selling on the streets five or six minutes after the last pages of type have gone into the stereotyping department.

The men in the pressroom have been taking things comparatively easy while their fellow-craftsmen in the composing-room and stereotyping department were preparing the forms for the next edition, but now the pressmen's work is to be done. Already, the wonderful machinery has been cleaned, wiped and oiled. Every screw, bolt, and nut has been minutely examined. On each one of the big rotary presses are great rolls of white paper, and other rolls of paper are upon the floor. Silently

and patiently the presses have been waiting to devour their huge meal.

At last the final sets of sterotype plates are received by the pressmen who quickly place them on the printing cylinders of the presses. The finishing touches are applied to the make ready; the ink-flow is carefully regulated; a few copies of the paper are printed and are found "O. K." An electric bell tinkles. Instantly the colossal presses start off at a tremendous speed, the printed and folded newspapers pouring forth in seemingly uncountable numbers; but as a matter of fact, the papers are automatically counted as they are stacked up in piles at the delivery ends of each press. The piles of papers are produced so rapidly that it keeps a force of men constantly busy at the work of carrying away the piles from the presses. As the edition rains forth the roaring of the printing machines can be heard at a distance from the newspaper plant. The first lots of papers are sent to the mailing room to be wrapped and addressed to subscribers. Bags of the papers are then taken by motor trucks to the special newspaper trains, and from the newspaper trains the papers will be dropped off at many different railway stations. A large fleet of motor trucks then start out to supply the newsstands and carriers of the city and suburbs. Within a few hours' time, and by means of the highly organized delivery system, several hundred thousand copies of the newspaper have been distributed over a very wide territory.

In these days there are, perhaps, not many persons who have never seen a modern newspaper press in operation. In the larger towns and cities the press-rooms of numerous newspaper plants have been so arranged as to give the public a "close-up" view of the big presses. In the wee hours of a morning can be seen groups of interested people standing in front of some newspaper building and studying every movement of the presses. There is something delightfully romantic about watching a mammoth newspaper press in operation at 3 o'clock in the morning. It is an enchanting picture that will attract old and young. Even lovers on their way home from a dance will stop to see this sight, no matter how late the hour. The double octuple newspaper press, which prints more than 95,000 copies of a 24-page paper an hour, is one of the modern seven wonders of the world.

The mechanical equipment of one of the largest and best-known newspaper establishments includes a battery of twelve sextuple presses, which when running to full capacity, deliver 360,000 copies of a 24-page paper every hour. More than an average of one hundred tons of newsprint pass through these super-speed machines every morning.

Impossible as it may seem to those not familiar with newspaper work, late news paragraphs and "extras" are often inserted in a newspaper while the paper is running through the press. This is done by means of "fudge boxes" in which the lines of late news are inserted, the fudge boxes being placed upon arbors on the press in such position that printing is done as the boxes revolve. A blank, two-column space has been left in the stereotyped plate of the page on which the late news items are to appear. As the papers are printed, the page having blank space comes in contact with the type matter in the fudge boxes, and thus the blank space is filled in. The fudge boxes can be instantly changed for others while the press is in motion.

Some years ago a noted statesman was delivering an important address. Not far away from the hall where the statesman was speaking is a famous newspaper plant, and in this plant the speaker's address was being put into type, the copy being rushed to the composing-room piece by piece. Towards the close of the speech the page was locked up and stereotyped, leaving a blank space for "fudge." The concluding sentences were set up and put into fudge boxes, and by the time the stereotype plates were on the press the fudge boxes were ready to be dropped into position. Just as the audience was preparing to leave the hall, in bounced newsboys with copies of the newspaper containing the entire address of the statesman. Three minutes after the end of his address the speaker was handed a copy of the paper containing it! This is merely one of many examples of fast newspaper publishing.

Early in the morning, when the stars seem to shine brightest, and when the stillness of the air is disturbed only by the rattling of a bread or milk wagon, out come the newspaper men of the night from the now quiet newspaper building. To them the crisp, cool air is decidedly refreshing. In the deep blue heavens there are already streaks of pink, yellow and orange telling of the sun-rise that soon will take place. Everything is peaceful, and to the drowsy newspaper men the great out-of-doors appears like a beautiful dream.

The "open-all-night" cafes and restaurants are immediately visited by many of these tired workers. Reporters, "re-write" men, compositors, linotype operators, stereotypers, and pressmen all "belong to the same union" when it comes to sitting down before a substantial meal. Many a bright, witty story is told when these good fellows get together. If the morning paper has "scooped" some exceptionally live piece of news, there is always much rejoicing. Yes, the newspaper men of the night have once again put out all the news that's fit to publish for the still slumbering public, and before going home these workers must enjoy an hour's recreation in their peculiar Bohemian way.

With the coming of another evening these workers of the night will again act their parts upon the stage in Newspaperdom, while the comedies of life, shall laugh, and while dark tragedy stalks about with cowled head. There will be rumors of wars to report, and who knows but that another World War will break out before the

next morning's paper is published? Births, marriages, deaths, business failures, fires, bank robberies, murders, horse races, and a thousand other happenings will have to be storied in tomorrow's first edition of the paper, but now for a short period the newspaper men of the night will leave the stage while the daytime workers hold full sway.

Although the newspaper night workers are simply out of contact with most of the things which enter into the life of the average person, yet somehow they manage to find time for church-attendance on Sunday morning. In New York City, Philadelphia, and other large cities certain Catholic churches have arranged special 2:45 a. m. services especially for newspaper men who work at night. These "printers' masses," as they are called, are always crowded. Churches of other denominations have also arranged early morning services for newspaper night workers.

It is only human, of course, for the general reader of a daily newspaper to become peeved when suddenly meeting a "pi-line" in a highly interesting news article, and in many instances, when the wrong line is removed in making a correction in type matter, an item reads strangely, indeed. But, during the strenuous rush at the form-closing hour in a newspaper composing-room, the "pi-line" and the "wrong correction line" are very apt to slip in, and the newspaper men of the night should be pardoned if they do commit an error or two in their nerve-racking work. The wonder is that the average morning paper does not contain a large number of serious typographical mistakes when the work is accomplished under such trying conditions.

Britannia Metal—IV.

Professor William H. Varnum, University of Wisconsin.

THROUGHOUT its history, the art of the pewterer shows little variation, either in ingredients or in improved methods of production. In a way, this condition is paralleled in pewter *design,* inasmuch as there are no definite division points like the Chippendale, Heppelwhite and Wedgwood periods of other crafts. We may divide pewter designs loosely into Medieval, Elizabethan, Stuart and Late (including Colonial) if we like, but unfortunately there are no clearly marked and distinguishing characteristics of those epochs. For example, the tea pot of Problem 1 in its cone-shaped sides and straight spout, bears a resemblance to a similar English pattern of 1770, but there were many other tea pots or similar forms designed at the same time, varying from this type.

We do know, however, that the pewters' art is one wherein imitation of the work of contemporary gold and silversmiths become the rule. It seems unusual that a type of craftsman standing for the best ideals in workmanship and purity of materials should lack the initiative with which to develop original designs. However, if many designs were plagiarized, it was with a full understanding of the limitations of pewter.

Characteristics of Pewter and Britannia Design.

Just how should a design in pewter differ from a similar pattern in silver? Compared with silver, Britannia or pewter are softer metals. Softer metal calls for more robust or fuller curves, better able to withstand the blows and shocks of service, but these robust curves do not need to depart from graceful curvature. The better pewter designers were able to do just this, combine the element of service with graceful contours; beauty without clumsiness, which is the essence of structural design. Furthermore, fine details and delicate surface enrichment on exposed surfaces are unwise as they will be obliterated by constant wear. Thus substantial but graceful contours and perfect simplicity will summarize the characteristics of Britannia design.

The Historic Background.

To teachers and students of the art crafts, it is becoming more and more apparent that in order to develop designs in the true spirit of past ages, some distinct type of preparation is vital. One cannot plunge into Queen Anne or William-and-Mary periods, and in a haphazard fashion, drag out some pattern. One must understand something of the history of the times, the spirit in which the Dutch and English craftsman-designer approached his problem. One may capture a William-and-Mary chair leg here, a chair back there and attempt to assemble them in an incongruous design entirely out of proportion to the character and spirit of that period and type of furniture.

A serious study of historic styles is necessary if we are to avoid a bastardly design. Mr. Richards in his recent book "Art in Industry" from positive data proves that a knowledge of historic styles is demanded by designers in nearly every large industry dealing with period production. Either as a cultural or a vocational subject, historic ornament will show its worth.

The Problem.

With this historic past in mind, let us select our next project from a distinct period, namely the American Colonial, and for the problem, a low bowl or porringer with one "ear" or handle. Museums exhibit many porringers, both in silver and pewter. In the past these bowls had varied uses, some for wine-tasters, others as containers for the blood which surgeons and barbers were prone to remove from patients with fever, although this use of the porringer is a contested point.

Harrison (1577-87) wrote: "Of porringers . . . and others like I speak not, albeit that in the making of all these things there is such exquisite diligence used, I mean of mixtures of the metall and true making of this commoditie (by reason of sharpe laws provided

on that behalfe) as is not to be found in any other trade."

The French used a high and thick cast porringer for vegetables. These date back to a very early period when they were known as *esculles.* Possibly through association with the pantry this word became anglicised to "squillery" and finally to the modern word scullery. These high porringers were probably similar to Figures 3 and 4, Plate 1, as their sizes (6¾") and shapes would indicate.

The ancient Scotch porringer of Figure 1 was undoubtedly a forerunner of the later type seen in Figures 5 and 6. A graceful high bowl with lid, used to contain *caudle,* an early English drink, was occasionally called porringer. The problem for this article, began its career in England during the last half of the seventeenth century, emerging from a variety of shapes and under the name of *counterfette,* or porringer, serving as a container for soft foods and for *parraitch.*

This form, similar to Figures 5 and 6, came to the

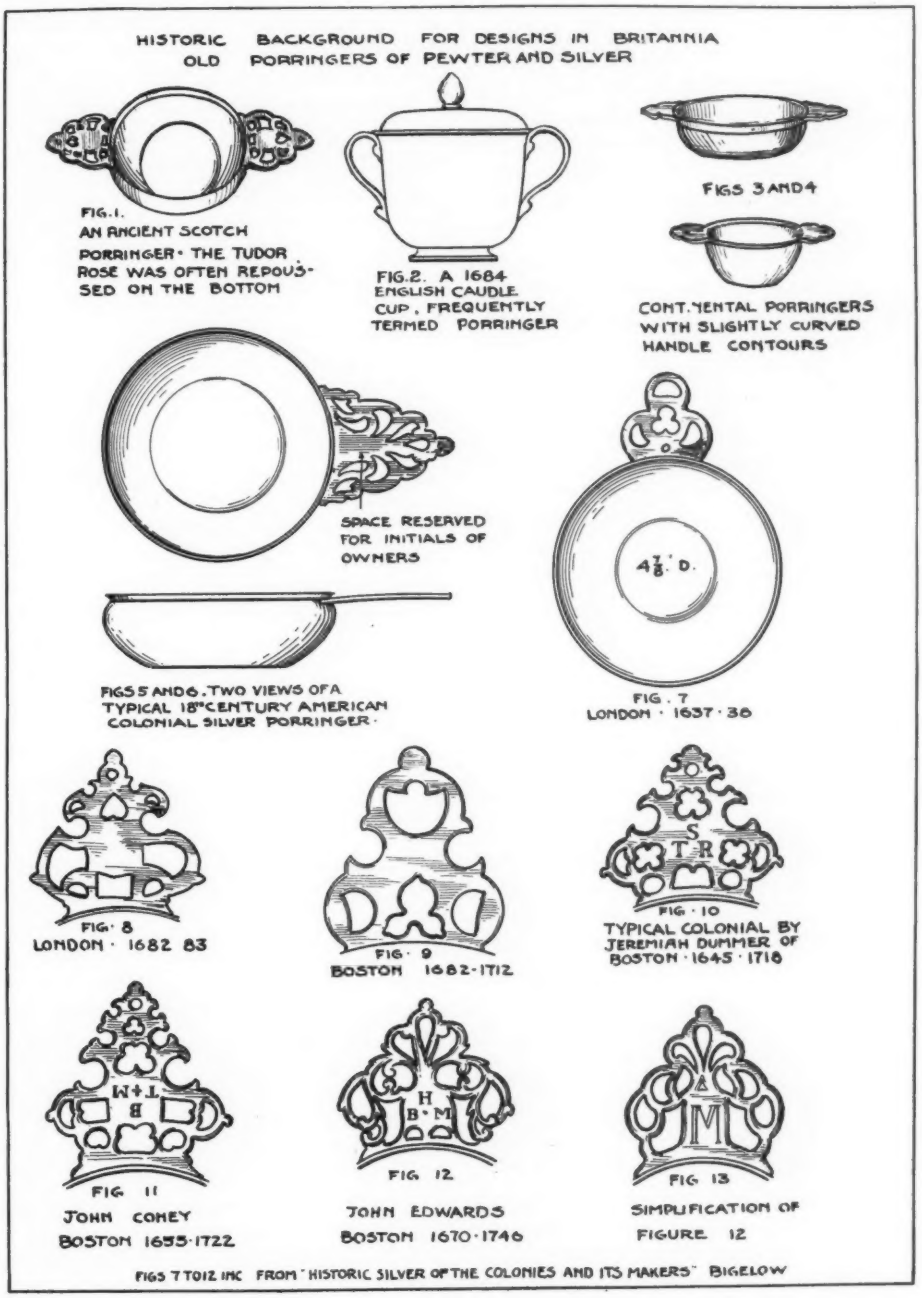

HISTORIC BACKGROUND FOR DESIGNS IN BRITANNIA
OLD PORRINGERS OF PEWTER AND SILVER
FIG. 1. AN ANCIENT SCOTCH PORRINGER. THE TUDOR ROSE WAS OFTEN REPOUSSED ON THE BOTTOM
FIG. 2. A 1684 ENGLISH CAUDLE CUP, FREQUENTLY TERMED PORRINGER
FIGS 3 AND 4
CONTINENTAL PORRINGERS WITH SLIGHTLY CURVED HANDLE CONTOURS
SPACE RESERVED FOR INITIALS OF OWNERS
FIGS 5 AND 6. TWO VIEWS OF A TYPICAL 18TH CENTURY AMERICAN COLONIAL SILVER PORRINGER.
4 7/8" D.
FIG. 7 LONDON · 1637-38
FIG. 8 LONDON · 1682 83
FIG. 9 BOSTON 1682-1712
FIG. 10 TYPICAL COLONIAL BY JEREMIAH DUMMER OF BOSTON · 1645 · 1718
FIG 11 JOHN COHEY BOSTON 1655-1722
FIG 12 JOHN EDWARDS BOSTON 1670-1746
FIG 13 SIMPLIFICATION OF FIGURE 12
FIGS 7 TO 12 INC FROM "HISTORIC SILVER OF THE COLONIES AND ITS MAKERS" BIGELOW

PLATE I.

American Colonies and was produced and used for a variety of purposes. One design shows a cover added, with the idea of using the bowl for sugar. Many of these colonial bowls are still in use for salad dressing, confectionery, card and ash receivers, nuts, vegetables, and as children's bowls.

The Design.

The outline of the body of the Colonial porringer varies but little; the individuality of the maker appears in the handles. For this problem, we may assume the curve shown in Figure 5, Plate 1, as typical, omitting for technical simplicity the upper outward projection. The contour curve is pleasing in its variety, while its sturdy but graceful sweep is suited to Britannia construction.

The handles are enriched by pierced or fretted patterns. As these have survived the wear of centuries, we may well adapt this form of enrichment. Our problem then is to adopt the bowl contour, choosing a width from within the ranges given on Plate 2, Figure 1, and restricting the height to 1¾" or less.

As the design emphasis rests in the handles, it is well to consider what problems are involved. (1) As the handles are appendages they must join the bowl in a harmonious manner and preferably with a tangential or a right angle junction. (2) The handle must have aesthetic proportions properly to balance the bowl; best studied in a top plan view, while the utilitarian proportions must be so planned that the bowl will not be tipped by its weight. (3) The pierced enrichment should present a unified appearance as opposed to a "spotty" design. Furthermore the pierced units are to conform to the outside contour and must form a harmonious transition from the bowl to the apex of the handle. (4) The design must be in the "spirit" of the period: adapted to Britannia.

The handles on Plate 1 are typical specimens one finds in technical books on the subject. They were constructed in silver, but as I have indicated, the parallel between pewter and silver design is close. The examples range chronologically from 1637 to 1746, covering the period we have selected, and geographically from London, the parent source of this type of pattern to Colonial America, the territory of our problem. One notices a marked similarity of pattern between the English designs and those used in this country. This marks the spread of style or influence, just as in our day, Parisian styles quickly appear in New York.

What is the spirit of the patterns? From study, we see that they are frankly formal and geometric in character normally to be expected from our Puritan ancestors. The Gothic trefoil (three lapping circles) and the compass arc may be seen in Figure 7. The three lobes of the trefoil, elaborated by various arcs, semi-circles, quatrefoils and the like are plainly to be traced in the following patterns. In the pattern of Figure 12, Mr. Edwards has modified the severity of the circle by the classic scroll, a colonial characteristic, but the influence of the original trefoil pattern is noticed in the shape of the contours.

It may be said that the pierced elements are grouped into a formal balance marked by a near-pointed terminal, broad base, with bounding contours corresponding broadly to a trefoil pattern. Let us test the various patterns by the design rules indicated in a previous paragraph. (1) All the handles join the bowl in a harmonious manner. (2) The handles shown are well balanced with the bowl. (3) Figures 10, 11, 12, and 13 show the best harmonious arrangement of pierced spots; Figure 9 has a scattered appearance while the lower fretted areas fail to connect with either bowl or contour. Figure 7 shows less pleasing relationship between spots, while the amount of metal remaining uncut gives a clumsy and heavy aspect to the design.

One must not forget to consider the part played by the shaded Roman initials of the owners, as they help to balance the design, while adding marks of distinction to the ware. Each pattern has a pierced area at the top, presumably for convenience in hanging to shelves. (4) In translating these designs to Britannia, adding our own arrangement but retaining the original spirit of pattern design, it is well to avoid small projecting points and other weak areas. Figure 13 shows an adaptation of Figure 12, with areas of sufficient strength to withstand wear.

To maintain the character of the originals, initials should be engraved. Lacking knowledge of this, a block Gothic letter may be attached by soldering. After several trial handle sketches have been worked out, one should be selected, perfected and added to the full size working drawing of the bowl. The handle is flush with the top of the bowl as we have illustrated in Figure 1, Plate 2. Two views, a side and top elevation are essential.

The Construction—Problem 3: The Bowl.

From the working drawing, one proceeds to cut a circular blank of 18 gauge No. 2 sheet Britannia metal. The diameter of this disc is ascertained by placing the end of a string or piece of binding wire at point A, Figure 1, Plate 2. Fit the string to the exact contour passing through points B and C, terminating at D. Measure this string; this gives the exact length of the profile. Add one-half inch to this for trimming and cut the blank of Figure 2.

A block of hard maple should be hollowed slightly (Figure 2a), and with the round end of the wooden mallet of Figure 3 the blank should be domed to the shape of a flattened saucer, using care to work along the outer portion of the blank, on a path shown by the dotted line of Figure 2. A second block is turned exactly to conform with the final shape of the porringer with the exception of two points: (1) The bottom of the bowl should be allowed to curve *slightly* downward as at point A, Figure 4, and (2) the porringer should be carried upward from its point of greatest width. The curve towards the rim is left for a later operation.

Continue the beating-down process until the bowl assumes the correct curvature. The partially domed bowl may be tipped at an angle, which often facilitates the shaping process.

If one does not have a turning lathe, an admirable substitute for the maple blocks may be found in a strong canvas bag filled with sand. With the mallet used on the maple forms, work slowly, following the outer contour of the blank. If the bowl does not exceed 1¾ inches in heighth, little trouble with splitting will be encountered. A template exactly conforming to the contour should be used in the manner of the try square, testing the bowl for inaccurate curvature. If wrinkles appear, place the bowl on a flat surface and hammer them out.

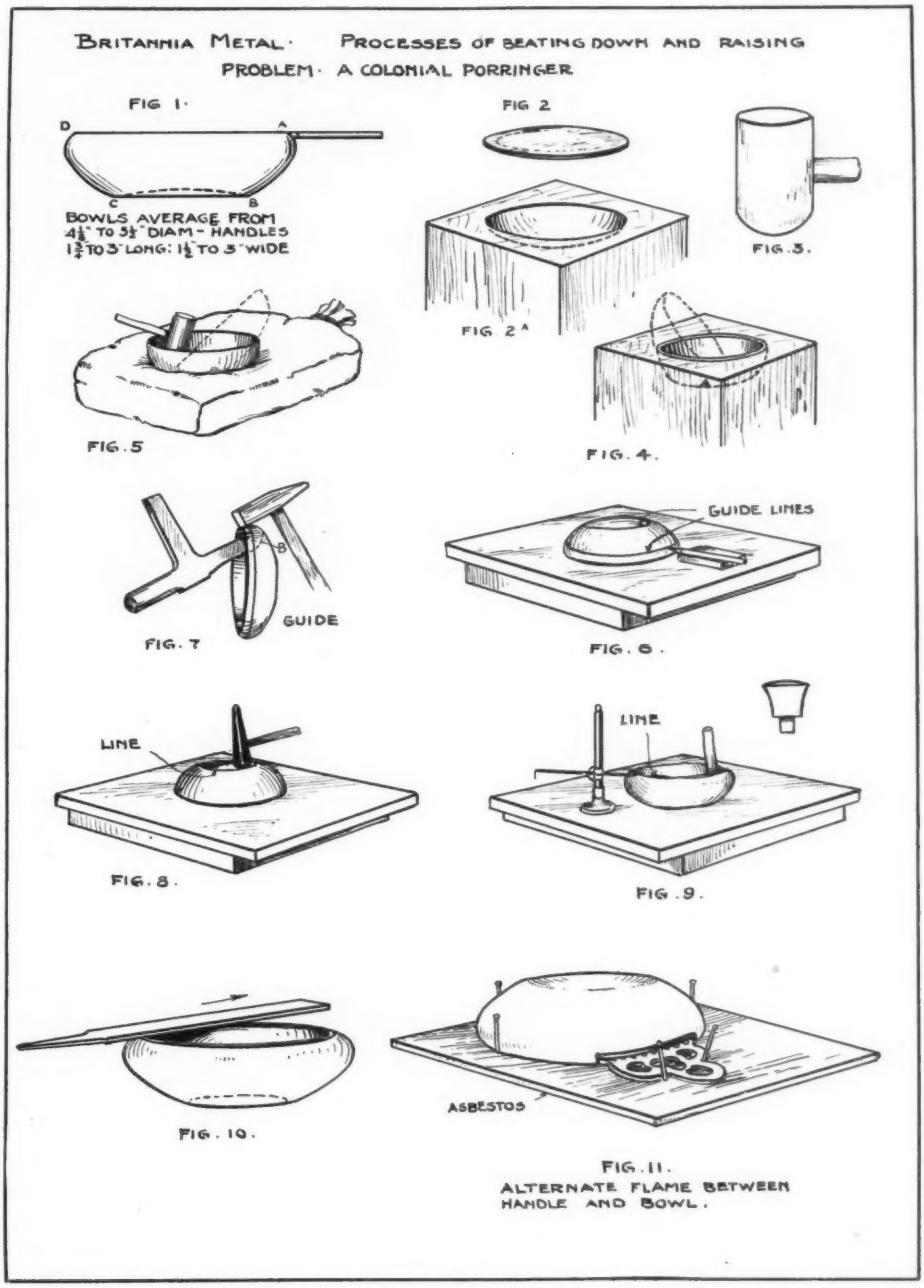


PLATE II.

The embryonic porringer is now inverted on a surface plate or other plane surface, and *pencil* guide lines are drawn at two points; at the point of greatest curvature and at the point of contact for the base, or the resting point of the form.

Raising.

A tee stake of Figure 7 is locked in a vise; the bowl is grasped in the left hand and by the rim. The forefinger is extended within the bowl and touching the end of the stake at point B, acting as a guide.

The object of this operation is as follows: With the flat end of wooden mallet the bowl is struck a sharp blow in the relative direction illustrated in Figure 7. If the mallet meets the metal directly above the point of contact with the stake, nothing occurs; if the stroke is administered one-eighth of an inch *in front* of the point of contact, the metal is forced inward. If the porringer is rotated in the direction of the hands of a clock and another blow struck, the inward curve is continued. Applying this, place the bowl with the guide line in exact contact with the stake, then strike one-eighth of an inch in advance of this point. Using the guide line as a gauge, continue entirely around the bowl. This is termed *coursing* around the bowl.

Tip the lower portion of the bowl away from you and continue coursing slightly nearer the edge and entirely around the bowl. Repeat this until the edge of the bowl is reached, allowing all blows to overlap each other. This is a difficult process and takes time to perfect. Beating down stretches the metal; raising is frequently used to contact it as in the present instance. As the surplus stock accumulates the contracted metal has a decided tendency to wrinkle. Overlapping wrinkles are disastrous. If they appear, hammer them out on a flat surface.

If the correct curve is not secured, repeat the operation, bearing in mind the fact that the slower the raising process, the less the liability of splitting or wrinkling. Raising is a very ancient process; in the history of the craft the hammer-men are referred to repeatedly. The importance of the complete raising process cannot be overestimated.

It will be found that structurally the bowl is much improved, as the inward curve has strengthened the rim to a marked extent. After testing the curves with a template, the bowl is again inverted on the surface plate. The base which should have a slight curvature outward is now driven down with the rounding end of a horn or wooden mallet, care being taken to hit lightly and evenly, just within the base guide lines. Repeat concentrically but nearer to the center until the base curves slightly inward to the desired extent.

The base may be brought into complete contact with the table by tapping lightly on a round end dowel held upright as in Figure 9. Slight imperfections in the bottom may be corrected by placing the bowl on the mushroom stake, Figure 9, and lightly tapping the inside of the bowl with the flat end of a wooden mallet.

With the surface gauge, draw a cutting line around the bowl at a point determined by the working drawing; trim with the jewelers' curved snips and file to the line (Figure 10). If much material has to be removed, use a double-cut hand file and finish with a single cut

A PEWTER TANKARD AT THE METROPOLITAN MUSEUM.

smooth. Remove the burr and soften the edge with fine emery paper.

The Handle.

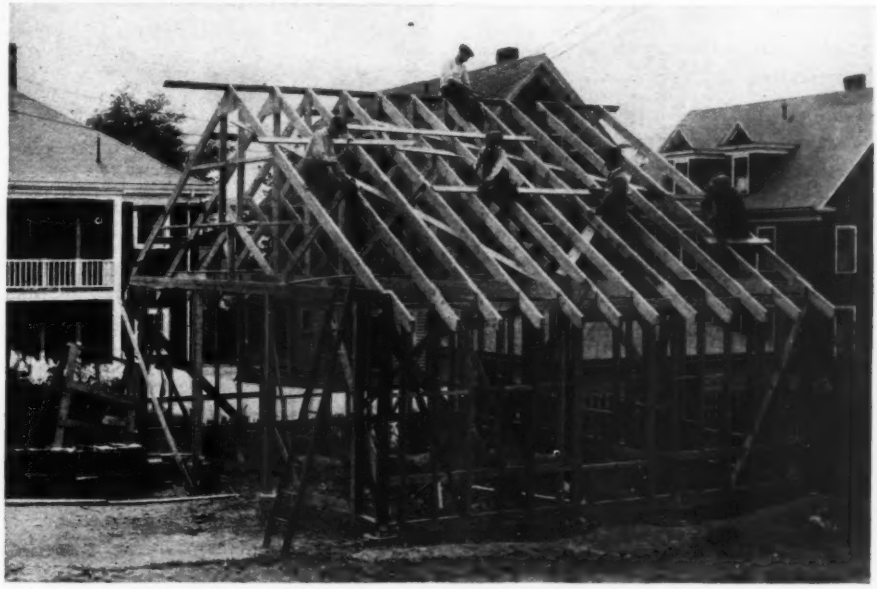
The handle is to be made of No. 1 Britannia, preferably from 16 gauge stock, provided this will not overbalance the body. The design is traced upon thin paper, transferred to the metal by means of carbon paper and made permanent by the use of the scratch point. The first step is to cut out the fretted or pierced units. Using a center punch, locate one or more holes in each unit. With a hand drill bore small holes at each center punch mark.

With a six-inch jeweler's saw frame and a No. 0 saw blade cut out each compartment just within the scratch point lines. True to the line with coarse needle files; follow this by cutting the handle contours and likewise filing to the outline. In Colonial ware, we find the handle edges slightly softened, which added interesting high lights on the edges and gave the effect of a slightly modeled surface. Small strips of fine emery paper will give the same effect to the handles of this problem.

The method of soldering the handle to the body is illustrated in Figure 11. The bowl and handle are brought into contact and held by small brads; the solder is placed along the point of contact while the joint is flushed by an even distribution of heat to both members. If light weight metal has to be used for the handle, it becomes necessary to reinforce the joint by adding a small strip of quarter round Britannia, attached to the body by *small* pieces of solder. Difficulty may be en-

countered in retaining the reinforcement in place, prior to soldering. One may overcome the difficulty by bending a brad at right angles, and inserting it into the sheet of asbestos, with the hooked end resting upon the added strip; place other brads similarly bent from end to end.

All scratches should be removed by fine emery paper and oil, and a dull finish given the entire porringer, as explained in previous articles. New tools for this problem are as follows: surface plate and gauge, tee stake, mushroom or bottoming stake, rectangularly shaped wooden mallet, horn hammer, curved jewelers' snips, saw frame (6") and one dozen No. 0 blades, hand drill and small twist drills. The sketches show substitutes for the surface gauge while any hard plane smooth surface will prove a fair substitute for the surface plate. The other items are comparatively inexpensive.



THE GARAGE UNDER CONSTRUCTION.

Teaching Carpentry in Trade Schools

Andrew Roswall, Head of Woodworking Department, Boston Trade School.

ALL trades are more or less difficult to teach in a trade school under actual trade conditions.

Conditions existing in trades are at times impossible to create in a school, and quite a number of them we would not create, even if it were possible to do so. If, for example, bricklaying is taught, a school would hardly attempt to teach its students how to lay a brick cornice on the top of a skyscraper under unfavorable weather conditions (even if it were possible), hesitating to do so, fearing both for the pedestrians below and the students above.

On the other hand, in cabinet-making conditions similar to those existing in the trade can be created by schools and instructors if the work is planned, executed and completed in like manner.

Related to cabinet-making is carpentry. It would seem to the uninitiated that in two trades so closely related (in fact, cabinet-making is a branch of carpentry) conditions and problems involving construction could very easily be carried out in school, but such is not the case. Carpentry in all its phases is generally a problem difficult to solve in a school.

Many varied attempts have been made, and perhaps in every school in which this subject is taught, different methods are used with more or less satisfactory results.

Efforts have been made to carry on all carpentry work in school on sections of buildings erected full size or to scale, without attempting any outside execution; or else buildings have been constructed by students on locations selected by school authorities and from materials purchased according to regular methods of contracting.

In the former case, it has been discovered that building models and sections of buildings in school has never proved entirely satisfactory for the reason that a model, if worked to a scale, does not give the student an opportunity to work in materials of equal size or weights, as on a building; nor can cutting, nailing or assembling be carried on as in building construction. Consequently methods of handling and assembling materials have nothing in common with actual carpentry, no more than the making of small models of yachts and boats can be classified as shipbuilding.

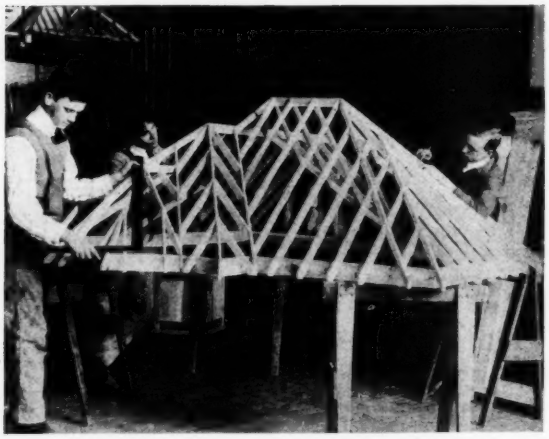
The construction of sections of buildings, such as corners including part of roof, cornice, framing, win-

dows, sills and doors does not give the student a conception of the whole. There are many various methods of doing this work according to building laws and methods used by different builders, and the student acquires experience on only a few processes, when in fact, many are being used in the trade.

Both of the above methods have the elements necessary for the training of students in carpentry. If the two methods can be combined, more satisfactory results are obtained.

The writer has given to these methods considerable study and experimentation with very satisfactory results.

A number of so-called school projects or outside jobs have been examined, and after consulting with several instructors who have handled such jobs, the conclusion has been reached that in most cases so large a job had been undertaken that the students did not have time to finish it within the school year. It has sometimes been difficult for the teacher to complete the job



2. ROOF FRAMING PROJECT IN THE SCHOOL SHOP.

THREE CAR GARAGE BUILT BY STUDENTS OF THE AUTHOR'S CLASSES.

on account of too much repetition thus tiring the student and making him lose interest in his work.

From years of experimenting on the best methods of teaching carpentry, the writer has found that by giving an elementary course in framing on models built 1½″ to the foot, which is the best scale (every ⅛ of an inch representing an inch) the student gains a technical knowledge of construction. Later on he should be placed out on a building (not too large) a garage or a four or five-room cottage, to frame and build. The two combined make an ideal course.

It is commendable for every school to try and turn out a better job than its neighbor but when a school undertakes to build too large a structure, it becomes a difficult task for both teacher and students to successfully complete it.

Trade schools are here to stay, and we all must do our part to make them a success. This can be attained by each one of us giving our experience to the other fellow, that he may profit thereby.

Three Minute Tests for Mechanical Drawing

W. W. Sturtevant, South High School, Minneapolis, Minn.

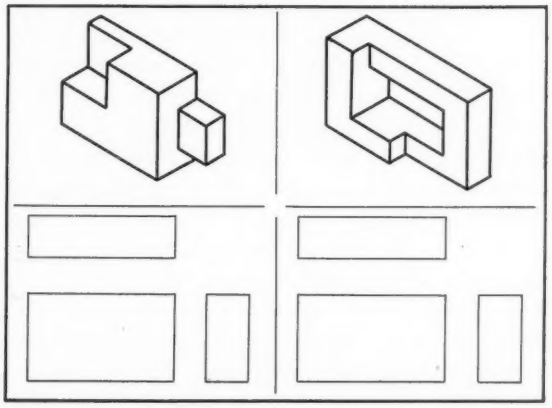
SOME time ago I decided that my classes in mechanical drawing would benefit by a little extra time spent in reading drawings and making drawings of simple blocks to test their knowledge of orthographic projection.

As I did not wish to take any considerable amount of time from the regular work I endeavored to draw up the problem in such a way that the pupil could put in the answer in the shortest possible time.

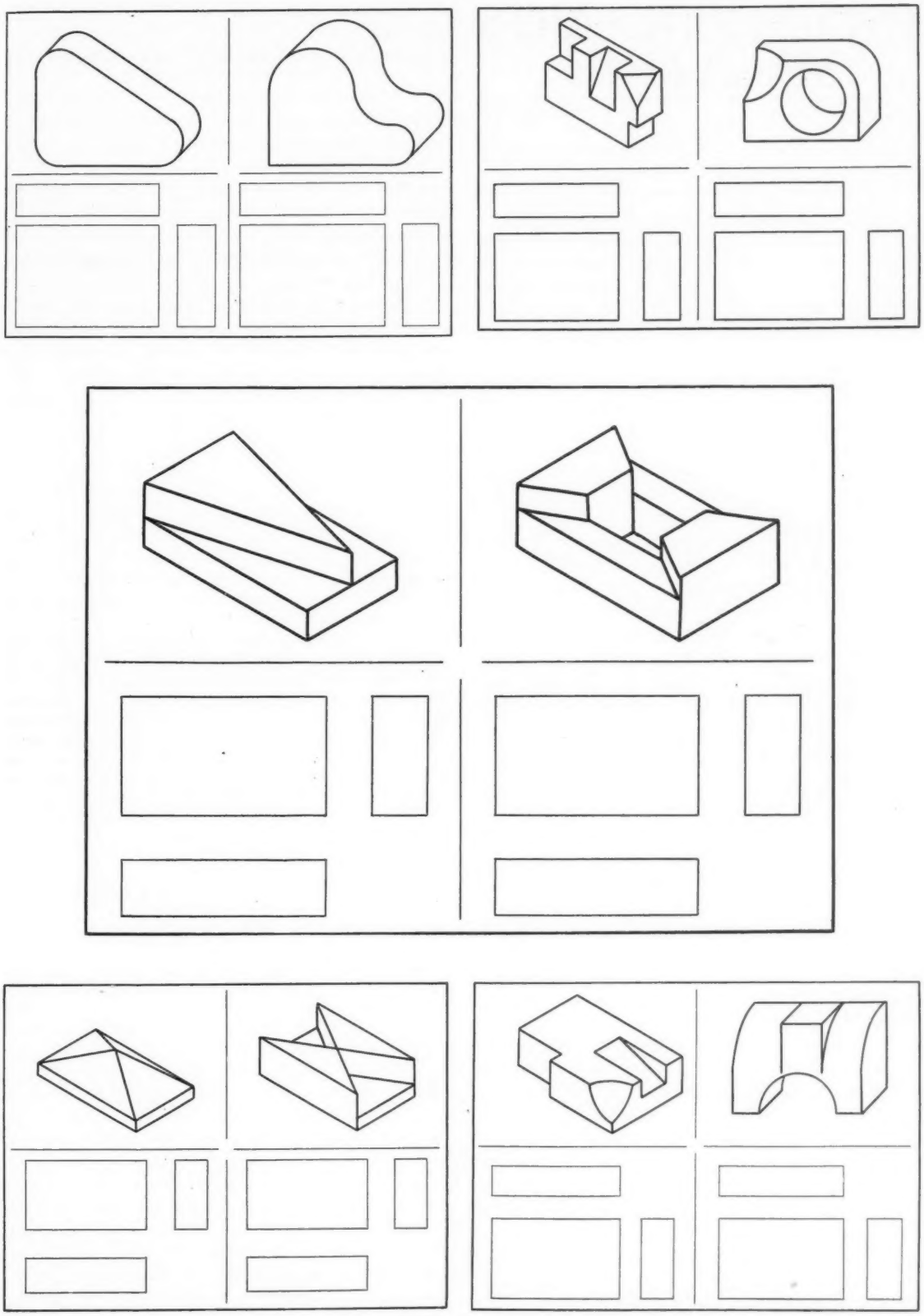
Mimeographed sheeets were given to each pupil and he was asked to draw the three views of the block in pencil.

The light lines of the outline served as guides and made it possible to complete the drawing very quickly.

These sheets have proved very satisfactory and well worth the time necessary to draw them up and print them.



TYPICAL TEST PLATE FOR THREE-MINUTE TEST.



TYPICAL PLATES FOR THREE-MINUTE TESTS IN MECHANICAL DRAWING.
The middle plate is reduced one-half from the original drawing on the mimeographed sheet

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN

Editors

EDITORIAL

THE UNIVERSAL KINSHIP OF SUBJECTS.

All education is inseparably bound up with intellectual processes. It begins with intelligence, uses information and experiences as its materials and instruments, and functions, if at all, in helping the world to do its thinking and its work.

For a long time—all too long a time—purely intellectual activities, disassociated from any material things and from any physical activities, were regarded as the sole means of education. It was the old story of the ancient languages, logic, abstract mathematics, etc. Anything that savored of use or practical value was, of course, not to be dignified by the name of education.

Then a new thought came into the world, a new element found its way into education, and a new movement started that has mightily influenced educational thinking and educational procedure. Manual training came tardily and slowly into recognition. Manual arts, industrial arts, vocational work, and all the various forms of practical education followed. The whole educational world for a time was submerged in these new phases of school work.

For a time there were zealous advocates of the new education who vigorously berated all forms of the "old education" and who could see absolutely no good in it whatever. A man holding a very prominent position in educational work was heard to say: "As much value is obtained by a boy in sharpening a cold chisel as in studying a whole year of Greek or Latin."

Happily, the extremists have not determined the educational policies and practices. The truth, as usual, has been found somewhere between the two extremes. There is still a place in the curriculum of the modern school or college for those subjects which the experience of centuries has stamped with approval. Any subject like language, literature, history, etc., that embodies the thoughts and the deeds of the torch-bearers of civilization in this and past ages is worthy of our study and of a place in a well-rounded curriculum. Furthermore, any subject or method that effectively fits the individual to live the efficient life, to do the necessary tasks, and to render his best service in any organized society is certainly not to be ignored in a modern curriculum.

The problem, therefore, has not been one of conflict and elimination—it has rather been one of classification, selection, and guidance. There is a place in the modern school for the classical, the technical and the practical. Let's get busy with the task of adjusting the individual to the curriculum that best meets his requirements.

THE PUBLIC SCHOOLS AND THE DEMAND FOR INDUSTRIAL RECRUITING.

The shortage of skilled labor in the building trades has brought into sharp outline the attitude of American industrialism towards the country's system of popular education. Recent events lead to the belief that, in part at least, it no longer lends passive encouragement to vocational education as an ultimate feeder to the cause of industrialism, but that it demands the services of the schools outright in providing skilled mechanics when needed.

There was a time when industry did its own recruiting into the ranks of skilled workmen. The schools were expected to train in the common rudiments of an education and not to meddle with the mechanic arts. But, a diametrically opposite attitude has been reared.

An instance of this attitude is afforded in the action of the building contractors of Cleveland, Ohio. When the Cleveland board of education did not find it practical to respond to the demands of the contractors with the readiness that was expected, the carpenters' apprentice committee gave utterance to the following:

"Surely the dire need for such a school and the national success which the Cleveland bricklayer apprentice school has attained would seem to have been sufficient to enlist the support of the Cleveland board of education. Such does not seem to have been the case, however, and unless there is something constructive done by the school board very quickly the 35,000 men affiliated with the local building industry and their families will have every reason to believe that the board of education is interested only in that small percentage of pupils (approximately 4 per cent) who are absorbed in the professions on graduation, and that as far as the local authorities are concerned the other 96 per cent may shift for themselves."

In discussing this utterance, the American Contractor, a leading builders' magazine, comments as follows:

"The attitude of the Cleveland board of education and other similar bodies that have acted in an identical manner appears inexplicable to those forward looking persons in the construction industry who clearly understand that the shortage of mechanics which is hampering the building program can be overcome only by educational efforts. American youth must be given an opportunity to acquire knowledge of the skilled trades without which building cannot be carried on."

Here is certainly a new viewpoint. The position taken by the contractors is to the effect that the training of skilled mechanics is no longer a duty devolving upon the industries themselves, but one that has been fully saddled upon the public school authorities. While the incident here recorded may reflect a somewhat local view, it is nevertheless indicative of an attitude that has been growing elsewhere in the country and that will continue to grow. This being true, let us see to what extent such an attitude is warranted at this time.

With the evolution of industrialism, namely, the advent of the machine, organization on a monster scale, mass production and the restrictions of organized labor,

the old time apprentice system went into the discard. The larger industries sought to overcome the effects of the change by establishing trade schools within their own plants. Some of these schools are successfully operated.

While this evolution was in progress the schools began to foster manual training, not so much for the purpose of rearing mechanics as for the purpose of adjusting the student more nearly to the common exigencies and duties of life.

Then followed the era of vocational training which is still to a large extent in its introductory stages. But, already enormous sacrifices have been made in various parts of the country to train the youth for vocational service.

The contractors who now make positive demands are evidently not conscious of the real function of the school, and its relation to the industries of the land. The schools are primarily established to train for citizenship and for service to society. The approach is in the interest of the pupils and not in the interest of any one industry.

This approach must primarily contemplate the inclination and adaptability of the boy for a vocation, if vocational studies are at all engaged in. The broader purpose must be to fit the youth for the common duties of life.

The day will come, no doubt, when the public schools through a fully developed system of vocational training will adequately meet the needs of industrialism and when demands for any given industry may be justified. Just now such demands are premature.

OLD AGE AND SCHOOL SPECTACLES.

Our forefathers would be amazed and perhaps disgusted with a program of school spectacles such as the games, social affairs, pageants, tugs of war, hobo-bands, parades, carnivals and circuses that serve to entertain the school communities of our time.

These various diversions are tolerated and encouraged by a majority of school authorities as a relief for the exuberance of youth in forms that can be controlled to some extent.

With the beginning of each school session the mature and serious teacher indulges in a period of looking through the school spectacles rather than at them. The frequent interruption of classroom work by a celebration of one sort or another gets on the nerves of the serious teacher who has before him a program of study that he hopes to carry out in the short school term.

It is evidently idle for the industrial arts teacher to stand out and alone against overdone outside interests. The better policy is to take a stand with them and utilize these diversions in every legitimate way as incentives to classroom work. The Industrial-Arts teacher is in a particular position to do this. We identified over half the industrial work exhibited in one community last year as work done by the students in preparation for games, pageants and other social interests outside of the regular program of work made by the teachers.

We sometimes wonder if there is a rational limit to such diversion. We know of school communities where the limit would seem to have been over-reached. We know a few Industrial-Arts teachers who seem more interested in the spectacles of their schools than in the schools themselves. Some teachers have become more famous and popular through their interest and help in carrying on school spectacles than in the conduct of their instruction.

There is objection to extreme indifference and to over-indulgence on the part of the teacher. Of the two evils we are not called upon for a choice, but realizing that the schools can never return to undisturbed class routine by dispensing with the diversions of youth, we conclude, in the wisdom and polity of old age, to keep *our eye on the ball* by attending every game and gaiety that we can afford and make the most of it in the classroom.

THE CHICAGO SUPERINTENDENCY.

For a generation the superintendency of the Chicago schools has been a man-killing job. Cooley and Shoop and Mrs. Young and Chadsey and Mortenson have all fought valiantly for Chicago children and Chicago schools. All, save Shoop, whose untimely death ended his service, relinquished the position probably with something of the feeling of defeat, or at least of regret at an unfinished and perhaps unfinishable task.

Mr. Mortenson's retirement has been announced. Chicago is probably now looking for his successor. Chicago cannot be advised. It asked for advice once and the educators with one accord said "Chadsey." Everybody knows the disgraceful episode of Chadsey and the Chicago superintendency.

We seriously doubt whether Chicago will tolerate, at least for the present, an outside man. But Chicago has two men who measure up to the full requirements of the job—William J. Bogan and William B. Owen. Bogan, as everyone knows, is the big, whole-souled, optimistic, forceful man's man, who is the very heart and spirit of the Lane Technical School of which he is the administrative head. Owen is the genteel, scholarly, discriminative thinker who makes people "sit up and take notice" when he discusses an educational question. He is the President of the Chicago Teachers' College, and has received the highest honors that state and national bodies of teachers can confer.

Both men are outstanding leaders in vocational education. Both were leaders in the small group that launched the Vocational Education Association of the Middle West, and Bogan has been its guiding spirit to this day. If Chicago shows the good sense to select either one of these men, it will be the wisest thing it has done in many a day.

SHOP PROJECTS FOR CHRISTMAS

PUPILS OF PECKHAM VOCATIONAL SCHOOL MAKE OWN CHRISTMAS GIFTS.

Hiram E. Greiner, Buffalo, N. Y.

Pupils of Peckham Vocational School, Buffalo, New York, during the week previous to the Christmas Vacation in 1922 made Christmas presents which they gave to members of their families. The gifts were designed by the boys.

The making of Christmas gifts had its inception some years ago when a few boys asked permission to make something for their relatives at home. Each year more boys requested this privilege, until this year all records were broken. Long before Christmas, groups of boys at different times asked Mr. William W. Miller, Principal of the school, if they could make Christmas gifts for some member of the family this year.

The vocational schools differ from other departments of public instruction in Buffalo in that the pupil does not make anything for himself during the shop periods. All his efforts in the shop are turned into commercial products. Hence, this desire to make something which may be taken home to show mother, father, sister or brother the skill that he has acquired in the course he is studying.

Mr. Miller and his faculty decided that the pupils would be permitted to make anything they wanted during the regular shop periods the week before vacation but this was to be under the supervision of the shop instructors, and approved by them.

The boys were delighted. They began planning weeks ahead. Drawings were made and later blue prints out of school hours. Teachers were consulted as to what would be the best gift for the various members of the family, and the best methods for finishing. This gave the bookwork instructors an opportunity for much related work, showing the necessity of the many parts of the various courses in a way not appreciated before.

In the vocational schools of Buffalo, of which there are four, Black Rock, Elm, Peckham and Seneca, the courses are two years in length. The boy devotes one-half his time to regular shop or practical work and the other half to book instruction which is closely correlated with the shop work and parallels it.

The boys of the wood-working department at Peckham Vocational School began to plan little gifts for the younger brothers and sisters, for mother and for father. Costumers, cabinets of many kinds and shapes, and numerous other articles of furture were planned.

But the boys of the machine-shop practice class were not to be outdone by the pupils in the wood-working department. Tools of many kinds were designed and made. Screw drivers, hammers, chisels, punches and other metal projects were made and hardened.

On the last day these boys were the proudest lot of lads ever seen. Carefully each article was prepared to be taken home. This idea of a gift helps form good habits for the boy as it makes him think of others besides himself. As Mr. Miller has stated, "we must all work to help one another."

TOY PROJECT OF SIXTH-GRADE ART CLASSES IN THE OKLAHOMA CITY SCHOOLS.

A Problem in Design and Color Correlated With the Manual Arts Department.

Mattie L. Jarrott and H. F. Rusch.

The need of art principles applied to various projects in the public school is self evident; also the need for a hearty cooperation between the practical art department and the regular art department is one that should be stressed.

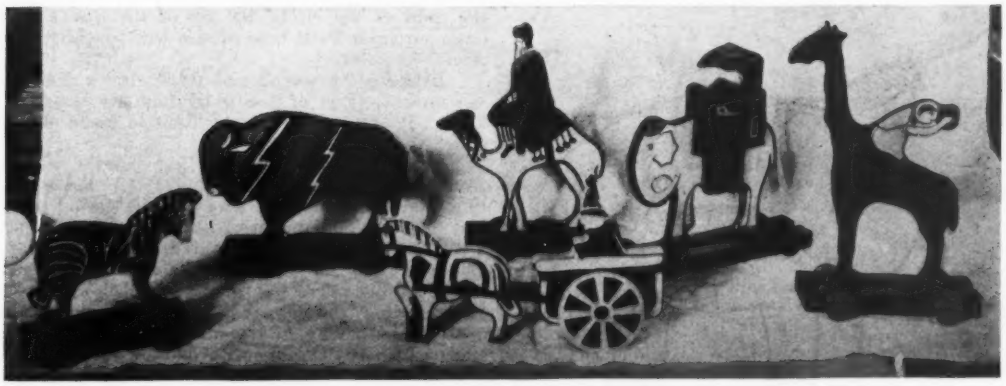
The toy project was a sixth grade problem. The children were told to name all the animals that are usually present in a circus parade. Different characteristics of various animals were discussed so as to find out just how much the children really knew. The assignment was made to look in story books and at any pictures they could find, to verify their thoughts and to practice drawing any and all the animals to gain skill in their work.

The children were then told to draw the animal or animals they would like to make into toys; the teacher limiting the size by giving a piece of paper the desired size for work. The best drawings were put up as guides to the other pupils.

Wood-block prints of animal designs either on textiles or cards were shown. The purpose of this was to show how designers have taken the dominant characteristics of an animal and by using the subject flat have been able to produce beautiful designs.

After these were perfected, the best were chosen and mimeographed copies were made, one copy being sent to the manual arts department to be used as patterns for sawing the toys. At this time different kinds of wood were discussed. For instance, the kind of wood which would be easiest to break or split when made into a toy, the kind which would take the paint the best and the kind which would be easiest to saw. In this way the teacher had a chance to bring in some very useful information which best comes through the manual arts and the geography courses. Three-ply wood was used in making the toys.

BOYS OF THE PECKHAM VOCATIONAL SCHOOL WITH CHRISTMAS PROJECTS MADE IN THE SHOPS.



A FEW OF THE CHRISTMAS TOYS MADE IN THE OKLAHOMA CITY SCHOOLS.

While the toys were being made in the manual arts department, the dominant color for the circus as a whole was selected by the art class, also the color scheme for each toy. A copy of the animal was made and the color scheme worked out in crayons, using the vertical strokes in order to build in the child's mind the idea of accuracy and neatness.

When the toys were returned from the manual arts department each child took his particular toy and all were ready to paint. On account of the brief time just one color was put on each day.

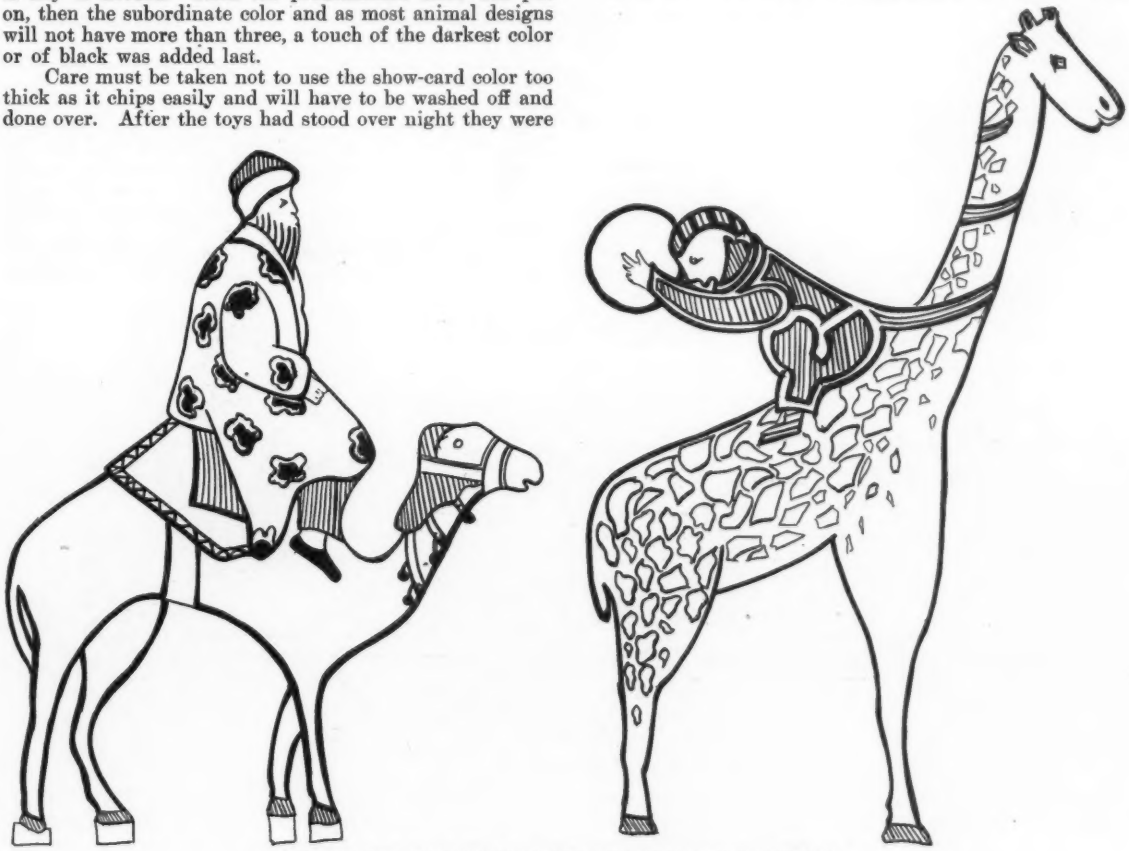
First the body color was put on. If white, all other colors were painted on top of it, covering as much of it as desired. If a color is used care must be taken to put on the lightest color for body coat and to leave all white, if any is needed. Then the predominant color was put on, then the subordinate color and as most animal designs will not have more than three, a touch of the darkest color or of black was added last.

Care must be taken not to use the show-card color too thick as it chips easily and will have to be washed off and done over. After the toys had stood over night they were ready to shellac. Two coats are much better than one. The first should be thoroughly dried before the second is applied. Bases and wheels were painted for each toy.

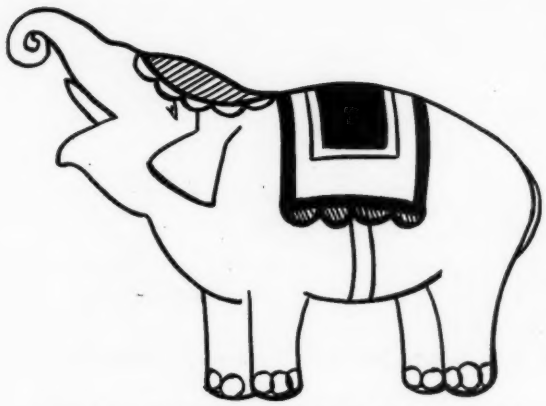
In the meantime, some three or four boys were assigned the making of a circus tent. Some were given the problem of advertising by making bill boards, signs, and posters to announce the circus; others were given the arrangement of the circus in line of march. Some children had the path of march made of sand; others, of sawdust.

After all was completed the different rooms in the buildings were brought in to see the finished problem.

The Oklahoma City public school project was one of social value as well as one of color and design. The children were asked if they would like to contribute to



DESIGNS FOR TOYS MADE IN THE OKLAHOMA CITY SCHOOLS.
(Reduced one-half.)



DESIGN FOR TOY ELEPHANT MADE IN OKLAHOMA CITY SCHOOL.

the Christmas fund for children who would not have much Christmas. This met with hearty response and as the circus was their only possession as a cooperative project, all were glad to give the toys. Consequently a Christmas card was made bearing the Christmas greeting from the different schools. These were tied to the foot of each animal, and the whole wrapped and distributed through a public agency, on Christmas eve.

PASTELESS HOLLY BASKET.

Harriet M. Higgins, Springfield, Mass.

Material.

1 piece of green paper 9″x12″.
1 piece of red paper ⅜″x7¼″.
1 piece of drawing paper 1″x1⅝″.

Draw the long diameter of the 9″x12″ green paper. On this line place a point 6″ in from one end (center of line). Using this point as the center describe a 1¾″ circle (radius ⅞″), a 2″ circle (radius 1″), a 2¾″ circle (radius 1⅜″), and a 5″ circle (radius 2½″).

Divide the 5″ circle into eighths by bisecting the angles.

Fold the 1″x1⅝″ piece of paper on the long diameter and cut a five-pointed holly-leaf (use full length and width of paper to determine the length and widest part of leaf).

Place the leaf pattern on each of the eight radii of the 5″ circle (long diameter of the leaf corresponding with the radii of the circle, the tip of the leaf touching the outer circle and the base of the leaf touching the inside circle) and trace.

Between the second and third circles draw ½″ lines ⅛″ on each side of the radii (sixteen lines). With a knife cut each of the sixteen lines to make slits through which to slide the runner.

For the handle draw two lines parallel with and ¼″ from the long diameter of the paper. At the ends of these lines trace the leaf pattern so that the second point of the leaf touches the diameter of the paper ⅛″ in from the end and the tip of the leaf extends below the handle on one end, and above the handle on the other end. On the end of the handle where the leaf extends below, draw a slanting line from the point where the leaf touches the lower edge of the handle to a point ¾″ in on the diameter of the paper. On the opposite end of the handle draw a similar line above the diameter. Cut these two lines, to slip the cut of one leaf into the cut of the other for fastening the handle together.

At the inside circle fold the leaves up and hold in place by weaving the runner in and out of the ½″ slits so that the red runner appears on the outside at the center of each leaf. Allow the ends of the runner to overlap (use full length of runner).

Pinch the leaves in the center so that the edges bend out.

The basket may be made with or without the handle and used as a nut cup.

CHRISTMAS DESIGNS FOR CARDS AND GIFTS.

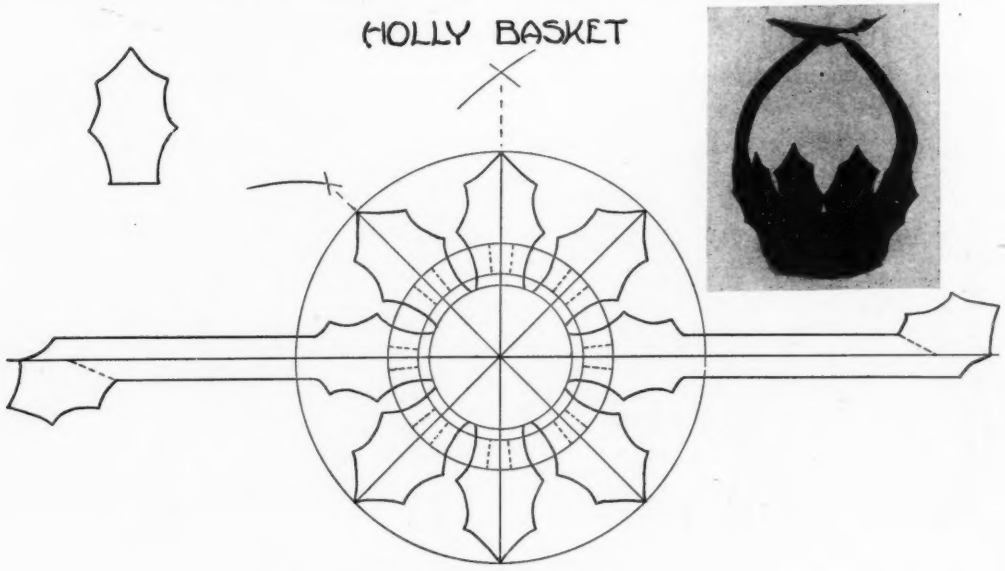
D. Elizabeth Roberts, Philadelphia, Pa.

Christmas is the season for gift making, and the person interested in the various handicrafts will find the designs illustrated very useful for the decoration of greeting cards, place cards and many small novelties.

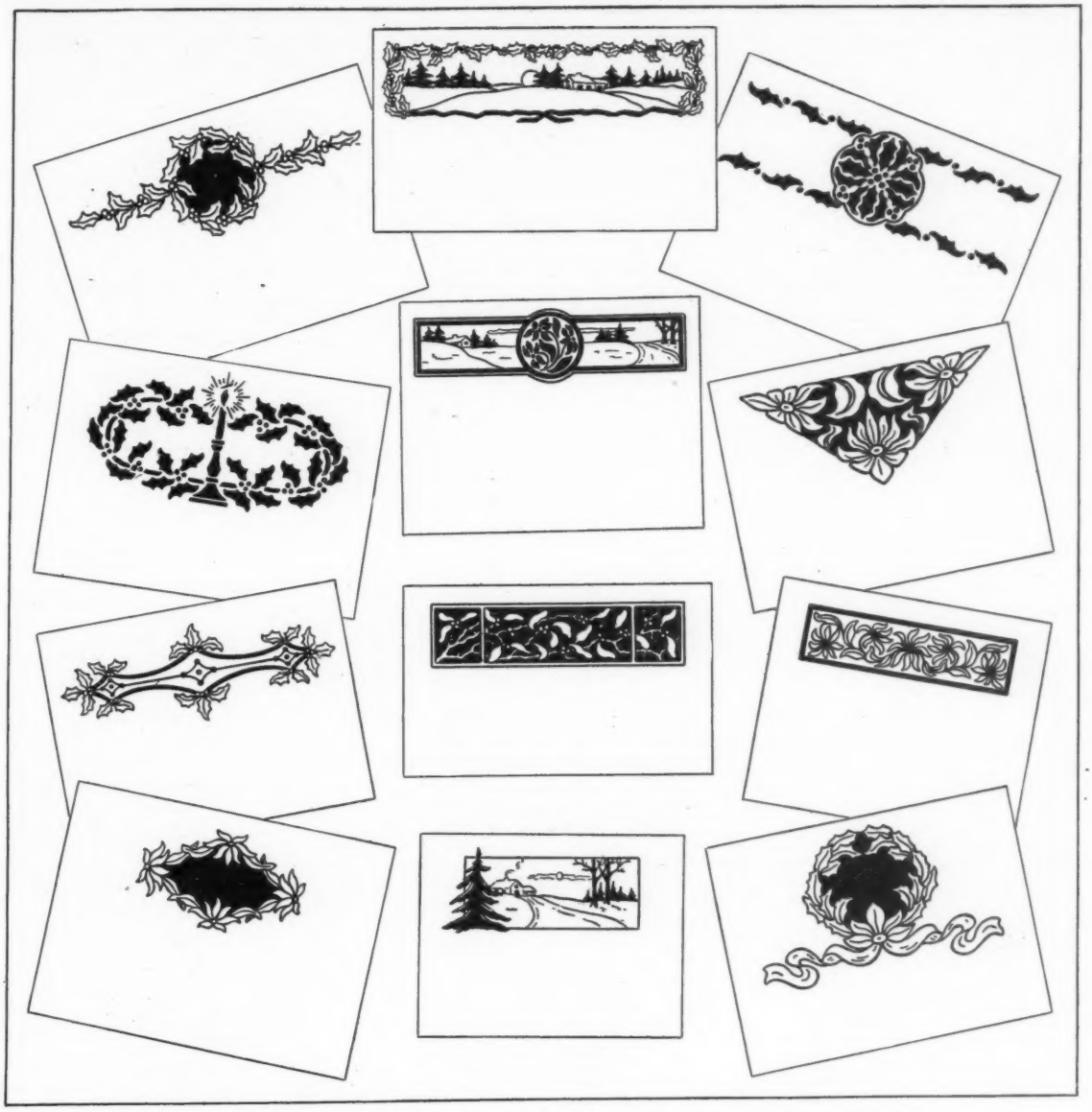
While the background of some of the designs and the ornament of others are in solid black, if a different treatment is preferred, the design can be outlined in India ink and the background and ornament tinted in water colors.

With the addition of a short greeting or Christmas verse, all of these designs make attractive greeting cards. The coloring adds to their attractiveness, the red and green of the holly and poinsettia giving them an especial holiday appearance. Either white or tinted art paper could be used for these cards and envelopes could be made to match.

Some of the designs would also make attractive calendars, tinted cardboard being used for a foundation

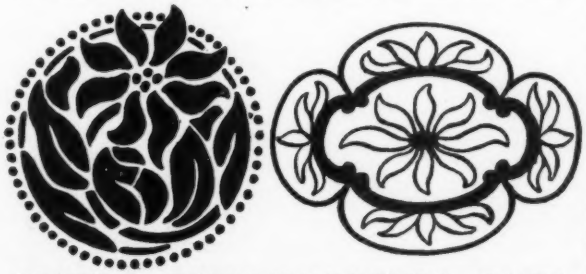


DETAILS OF HOLLY BASKET.



SUGGESTIONS FOR CHRISTMAS CARDS. (Reduced to slightly less than one-half of originals.)

with the addition of a small calendar pad and also ribbon or cord for a hanger. If the cardboard is light enough in weight to cut easily, the background of the two wreath



SKETCHES FOR CHRISTMAS CARD DECORATIONS. (Full Size.)

designs and also of one of the poinsettia designs could be cut out and a small photograph of a landscape pasted beneath. If the holly wreath designs are used for a card, the background may be cut out and a head of Santa Claus or a winter landscape pasted beneath, or this space can be used for a greeting.

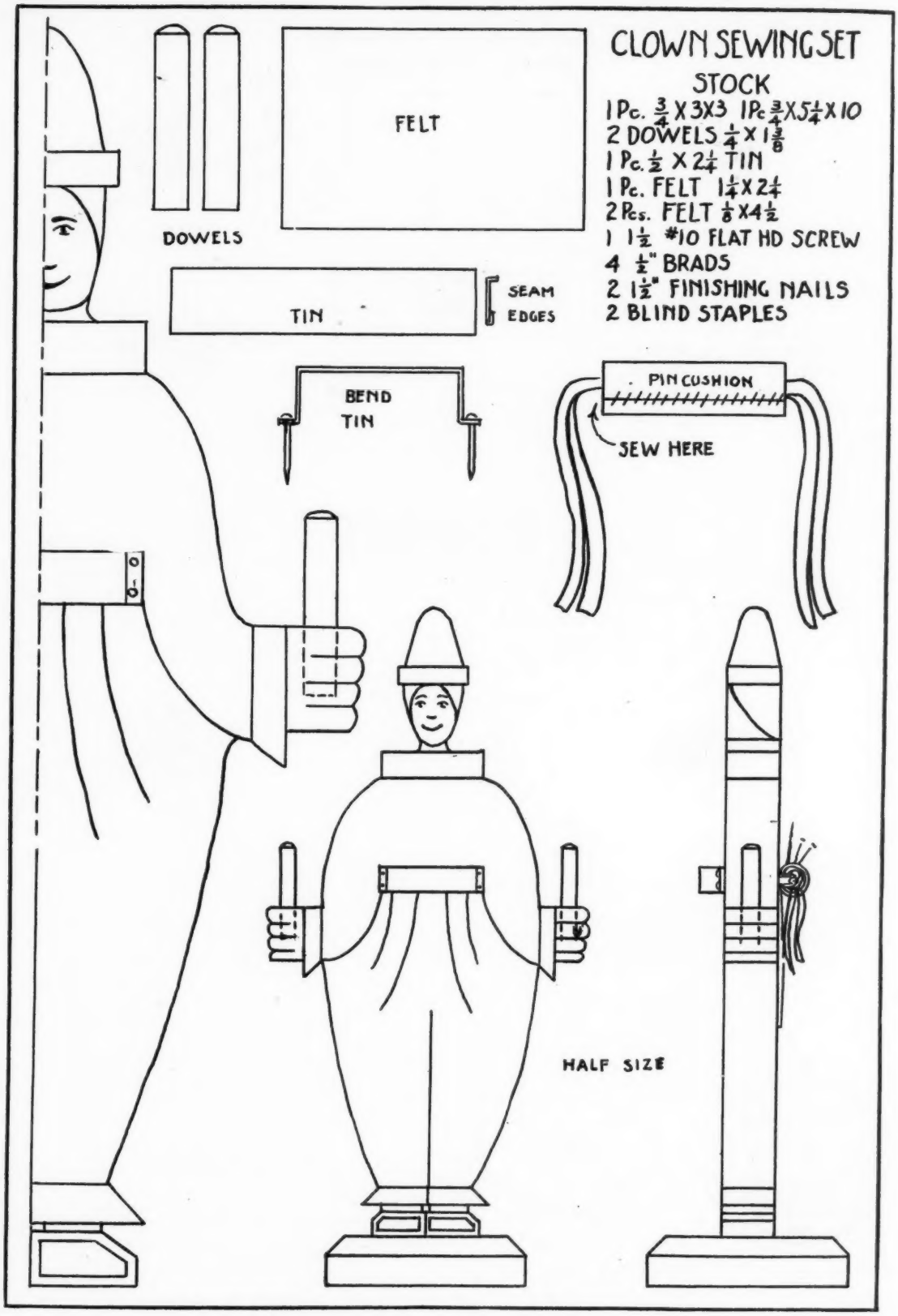
Many Christmas novelties may also be decorated with these designs. Among these, to mention only a few, are boxes for gifts or candy, blotters and other articles for a desk set, candle shades, memorandum books, picture frames, etc. Other suggestions will doubtless occur to each one who tries to make use of these designs for the decoration of Christmas gifts.

A CLOWN SEWING SET.

Daniel Darney, Director of Manual Arts, Leominster, Mass.

The clown sewing set has been made by the boys in the wood-working shop with much success because it is a novelty which secures and holds their interest. It can be made from scrap wood which would otherwise be thrown away. The model furnishes the boy with practice in the use of several wood-working tools as well as in painting. The clown is irregular in outline, therefore it makes a good problem in coping saw work.

Every boy will want to take the model home with him as a present to his sister or mother. If the sewing sets

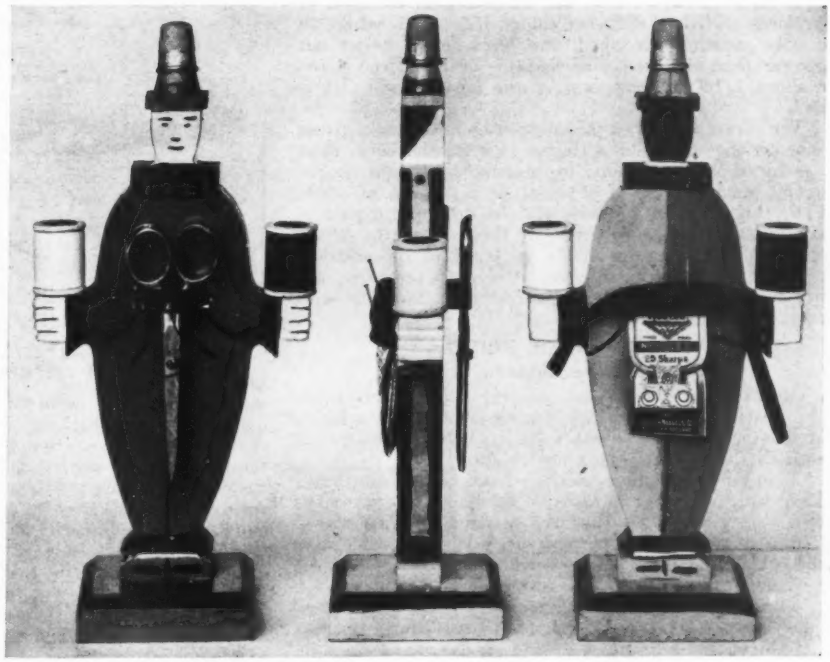

CLOWN SEWING SET
STOCK
1 Pc. 3/4 X 3X3 1 Pc 3/4 X 5 1/4 X 10
2 DOWELS 1/4 X 1 3/8
1 Pc. 1/2 X 2 1/4 TIN
1 Pc. FELT 1 1/4 X 2 1/4
2 Pcs. FELT 1/8 X 4 1/2
1 1 1/2 #10 FLAT HD SCREW
4 1/2" BRADS
2 1 1/2" FINISHING NAILS
2 BLIND STAPLES
DOWELS
FELT
TIN
SEAM EDGES
BEND TIN
PIN CUSHION
SEW HERE
HALF SIZE

FULL SIZE SKETCH OF CLOWN SEWING SET.

are made by the factory method, a ready market will be found for them at Christmas sales, school fairs, novelty shops, and Junior Red Cross Carnivals.

The clown sewing set is an attractive, unique, and useful addition to any woman's sewing table. It is in the form of a clown standing erect with his hands at his sides holding two spools of thread. He has a pair of small scissors in his belt at the front and a small pin cushion with a paper of needles below at his back. A thimble forms the top of his hat. The clown is painted in bright colors.

The materials needed to make this model are: 1 piece of any clear grained wood ¾″x5¼″x10″ for the clown; 1 piece of the same kind of wood ¾″x3″x3″ for the base; 2 pieces of doweling ¼″ in diameter and 1⅜″ long to hold the spools of thread; and a piece of tin which can be cut from a tomato can or tobacco box ½″x2¼″ for the belt in front to hold the scissors. For the pin cushion 1 piece of felt 1¼″x2¼″ and two pieces of felt ⅛″x4½″ for tying the cushion to the back of the clown are needed.



FRONT, END AND BACK VIEWS OF CLOWN SEWING SET.

The base is fastened to the bottom of the clown's feet by means of a No. 10, 1½″ bright flat-head wood screw. Two 1½″ fine finishing nails are used, one on each side of the screw, to prevent the base turning on the screw. Two blind staples for holding the cushion to the back of the clown and four ½″ brads to fasten on the belt at the front complete the list of materials with the exception of the paint and the shellac.

To make the clown sewing set, first square up the piece of stock for the body of the clown to the required size, ¾″x5¼″x10″, next, square up the baseboard to the size given in the drawing, ¾″x3″x3″, and make a ¼″ chamfer on all four top edges of this baseboard.

To get the shape of the clown, use a piece of stout paper, the exact size of the broad side of the piece of stock for the body, creased through the center on the long diameter. Trace one-half of the clown from the drawing, and with the paper folded cut out the two sides of the pattern at the same time. Next, place the pattern of the clown's body on the piece of wood, with the crease on the center line, open out the pattern, and trace on the wood. Repeat this operation on the opposite side of the same piece of wood.

Follow these lines with a coping saw and cut out the piece of wood in the shape of the clown. Finish to the line with a wood file. With a knife and a wood file taper the hat until it is cone shape and will fit into a thimble.

Locate all the holes. Mark two ¼″ holes in the center of the hands, to hold the upright dowels for the spools of thread; a hole in the center of the baseboard; and another in the center of the bottom of the feet of the clown. With a German bit, the size of the shank of the No. 10 screw up under the head bore a hole, where marked, all the way through the baseboard, and another into the bottom of the feet of the clown for about ¼″. Countersink the hole through the baseboard. With a ¼″ worm bit bore holes ½″ deep in the hands where marked.

Sandpaper and clean up each of the pieces of wood and attach the clown to the 3″x3″ baseboard, which has a ¼″ chamfer on all four top edges as shown in the drawing. Drive the two finishing nails through the baseboard into the feet of the clown. These will prevent the base turning on the screw.

To make the belt for holding the scissors cut a strip of tin the given size in the list of materials and fold or turn over the long edges. This can be done by placing the long edge of the tin so that it projects for about 1/16″ over the straight edge of a board and rubbing the projecting metal with the handle of a hammer until it is at right angles to the face of the tin. Turn the tin over flat on the board and gently tap with the face of the hammer until the edge is folded over on the tin. Do this on the two long edges of the tin. Bend this piece of tin to the shape shown in the drawing. Pierce each end with two small holes to take the small brads. This looped belt of tin should be attached to the front of the clown at the waist line as shown in the drawing.

The edges of one end of the dowels are next smoothed off and the dowels are then glued into the holes in the hands. Be sure that the two dowels are equal in height.

Drive the two blind staples into the back of the clown on a line with the belt in front. These staples are placed 1½″ apart or the length of the pin cushion.

The boys can use many color schemes in painting the sewing set. For one scheme the following is suggested. First, cover the entire model with a coat of gloss white paint. When this coat is thoroughly dry, paint the details in orange and black. With orange paint a narrow band around the hat, the ruffles at the wrists and at the bottom of the trousers, the metal belt, and the ¼″ chamfer around the baseboard. Touch the tops of the dowels with orange. When the orange paint is dry, paint the hair, the features, and the shoes of the clown with a fine brush charged with black paint. Lines to suggest the fingers and the folds of the clown's costume should be next added. If small black dots are skilfully touched in on the orange ruffles the model will be more attractive. When all of the paint is dry give the model a coat of shellac.

To finish the model make a pin cushion from the pieces of felt. This is done by placing the narrow strips of felt on top of the large piece and rolling the large piece around them. The roll when finished should measure 1½″ long and about ⅜″ in diameter. Sew the edge of the felt securely so that it will stay rolled. Attach the pin cushion to the back of the clown at the waist line by slipping the ends of the narrow felt through the blind staples and tying the narrow felt to each of the staples. Then drive the staples into the wood. The long ends of the narrow felt may be tied together to form a loop to

hold a tape measure. This pin cushion may be made of two pieces of felt of different colors, black and orange in the color scheme described, the black piece being cut narrower than the orange so that the orange piece shows for about 1/16" at each end of the cushion when it is rolled.

The clown sewing set is equipped by attaching a paper of needles, by means of a thumb tack, to the back, close up under the pin cushion; by placing a thimble on the hat; by placing a spool of black and a spool of white No. 60 thread on the dowels; and by dropping a pair of small scissors into the belt strap at the front of the clown. A few needles and pins should be stuck in the cushion.

The illustration which shows the front, the back, and the side, of the finished sewing set is of three finished models in different color schemes.

A TIPUP FOR ICE FISHING.

H. H. Todd, Amsterdam, N. Y.

An article that combines several different materials and operations, that is simple enough for any boy to make, and that is fun for any boy from ten to sixty to use, is shown in the accompanying drawings.

This type of tipup is used on Lake Champlain, but I believe will prove new to many other places. It combines many good qualities. When the cotter pins are removed and the tipup folded for transportation, it is small and light. The line never tangles while being carried, and the whole outfit may be taken down or put up in a moment.

The advantages while fishing are obvious. The great trouble with other types of tipups is that the line must be coiled on the ice and is always in danger of freezing fast, or catching on chips of ice, or not rendering easily through the hole in the ice while traveling over the rough edges. Or, if a flat reel is used the fisherman must be ready when the fish first strikes to feed line to the prospective victim, or the bait will surely be lost as well as the fish.

Fish like pike and pickerel must be allowed to run with the bait before they will stop and swallow the minnow, as usually the hook will not take otherwise. The run is limited only by the amount of line on the reel while using this outfit.

The construction is simple and needs little explanation. The wood used should be pine. If the movable bar is painted black and the rest white it will aid the fisherman in watching the limit of lines allowed by law especially if the holes are scattered. The wire with sliding weight is used to make the bar remain upright when a fish has struck. Fish are slow moving in winter and the

TIPUPS IN USE.

weight should be adjusted so that the bar is just off balance and a slight tug will free the loop of line from the end of the bar. Some fisherman put a small bell at the lower end of the bar so that a ring is heard when the weight drops. Empty typewriter spools may be used as reels, or the reels may be made of wood with the lathe or band saw, or could easily be made of sheet metal. A small loop is made in each end of the slider wire, and screws used to fasten the wire to the bar.

The cotter pins are the large type used in railroad shops and should be long enough so that the spring between the jaws will hold the parts in place and yet allow easy removal.

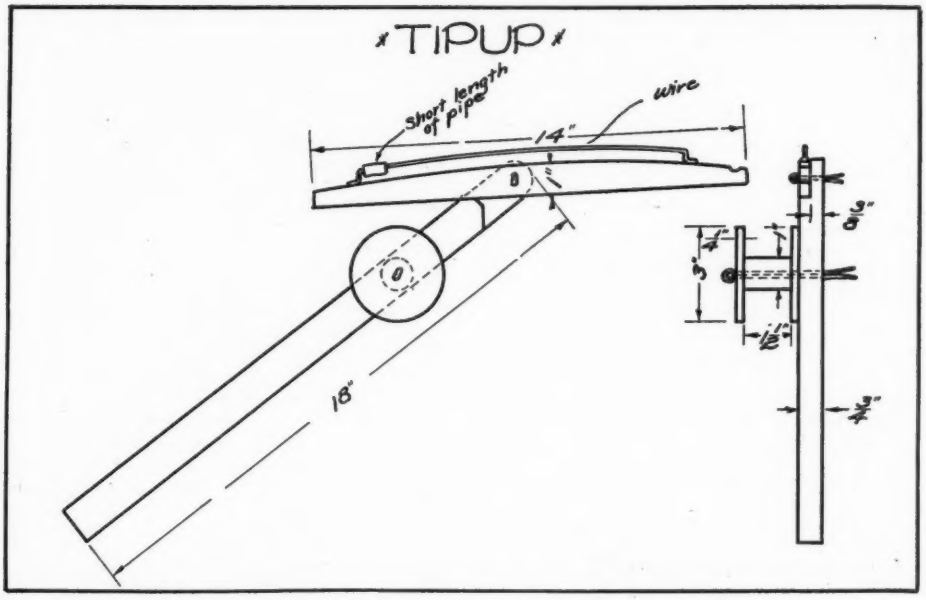
BASEBALL GAME.

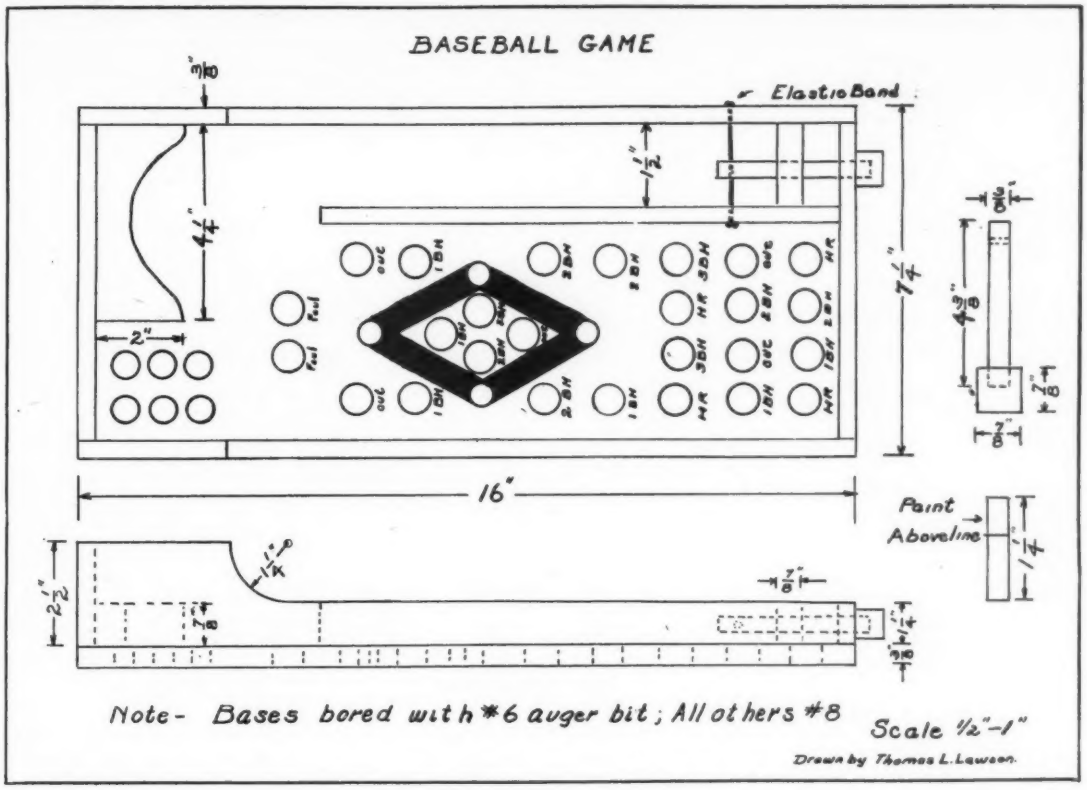
Thomas L. Lawson, Newark, N. J.

The baseball game in the accompanying drawing can be successfully made by boys from the sixth to eighth grades. It is a project which will hold the interest of the class from start to finish. Nearly every boy likes to make something with action to it, and this game provides that interest.

The baseball game includes squaring up of stock, boring and counterboring, some coping saw work, sandpapering and the opportunity for lettering, painting, and shellacing.

The game is made of ⅜" basswood as per dimensions on drawing. After the 7¼"x16" base has been squared to size, the alley, baseball diamond, and holes are then laid out. The bases and six holes in the upper corner, which are used to place the men in, when not in use, are bored with No. 6 auger bit; all other holes with No. 8.





DETAILS OF A BASEBALL GAME.

The diamond is painted with black water color and after it has dried, the ½" holes are then lettered as in the drawing, with a soft lead pencil. The game is then given one coat of white shellac and placed away to dry.

The sides, back, front and partition for alley, are then cut, planed to size and sandpapered, making them ready to be nailed in place.

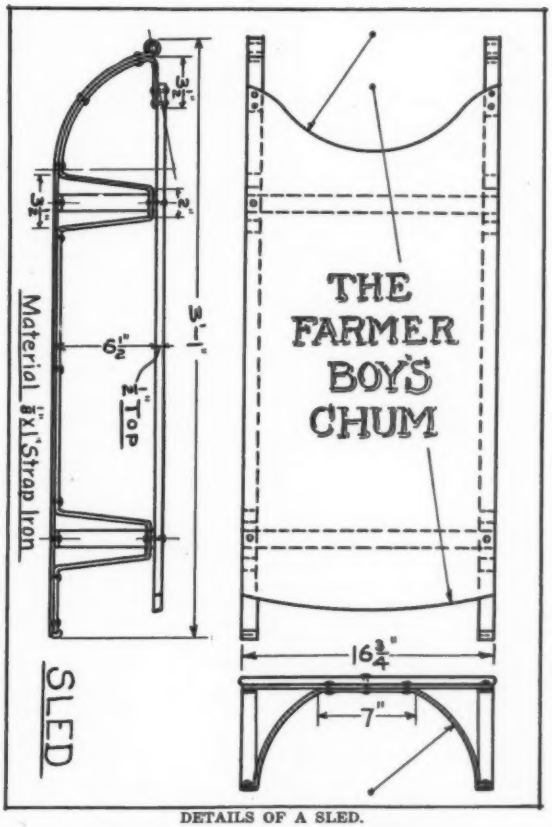
The following day the bottom is rubbed down with No. 0 steel wool and given a second coat of shellac, again rubbing down and waxing the next day. After nailing the sides and partition in place, make the shooter from a ⅜" dowel, the handle of it, from a ⅞" dowel as in the drawing. The shooter is supported by a ⅞" piece of wood 1¼" high. In drilling the holes for shooter, be sure they are in perfect alignment. Holes are then bored with a 3/32" drill in the side, partition and shooter, through which an elastic band is threaded, having knots at each end. The elastic should be drawn tightly across the alley, as the tighter the elastic, the more force obtained with the shooter.

The game may be painted in any color scheme desired. The writer painted the sides orange, and top edges black. The men are made of ⅜" dowel, three being painted black above line, and three orange.

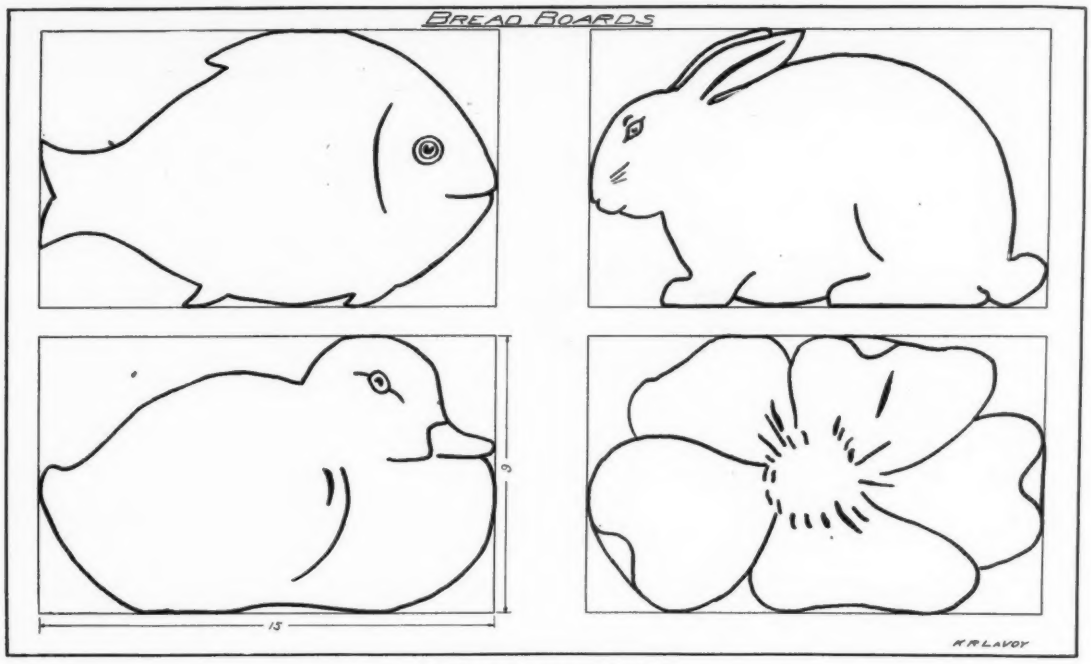
In reference to the piece of ⅞"x2" stock which is cut out by means of a coping saw, the marble should strike against this piece where the curve begins and not in the center of it. The object of this piece being, to throw the marble out into the field, and if marble strikes the center of curve, it will rebound to alley. The curve is not a true part of a circle, but cut deep enough to turn the marble into the field.

The writer after obtaining the correct curve made a pattern and each boy traces it, thereby saving time and wood.

In playing the game each boy decides on which color men he desires, and who is to play first. He then places the marble in front of shooter, draws it back, letting go suddenly, placing his man on the base, according to the



DETAILS OF A SLED.



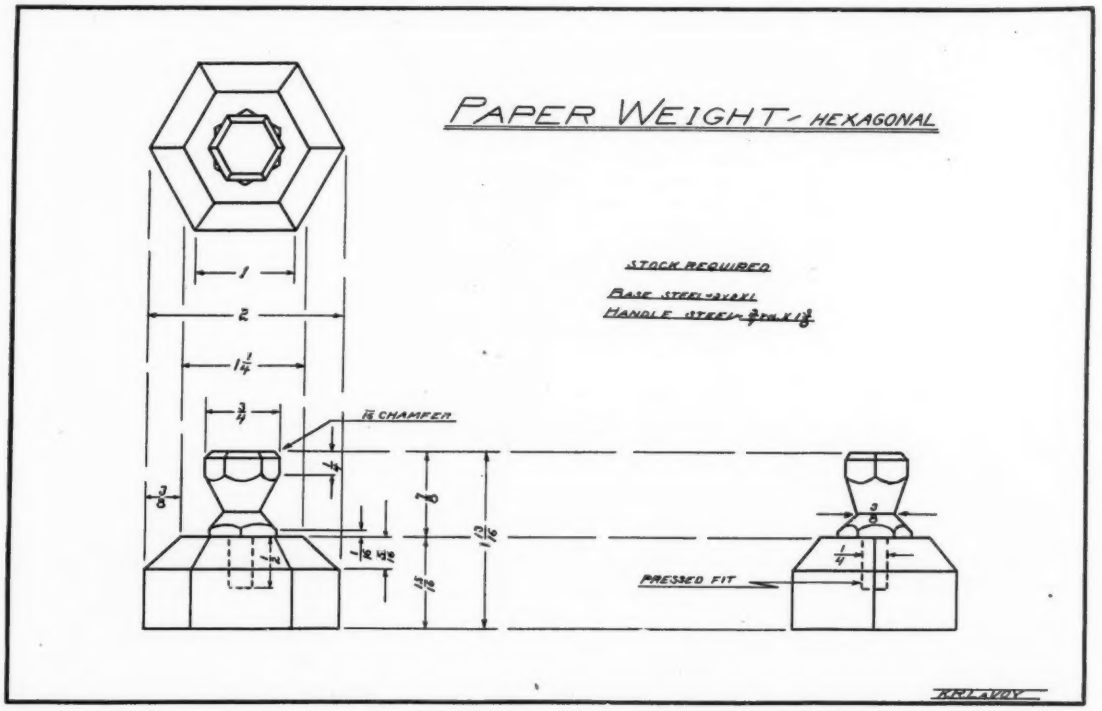
DETAILS OF BREAD BOARDS.

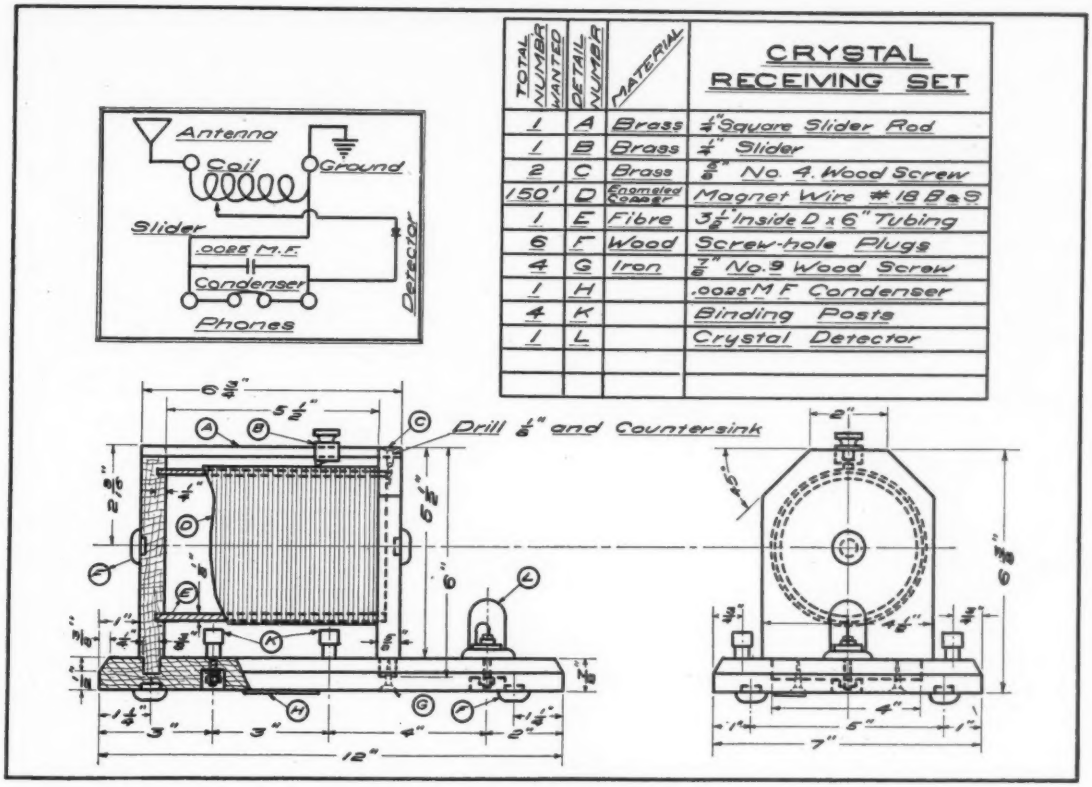
lettered hole into which the marble drops. If the marble does not enter any hole, or should enter one of the bases, or, jump over the back of game, it is considered a strike.

BREAD BOARDS.

Kenneth R. LeVoy, New Rochelle, N. Y.

Bread boards, of course, are an old subject in manual training; boys have made them for years. One wonders, however, if they really felt repaid for their labor in shaping the board oval and beveling its edges, if they found any satisfaction in the result, aside from mother's thanks. After all their work the board was still a board,—nothing more,—a thing for utility, not ornament. My idea is to combine the two, appeal to the boy's interest, and give him a choice in the selection of the design. The drawings offer suggestions for doing this, showing how familiar motifs may be adapted for the purpose. In this way the problem is enriched but not made too difficult. Any markings that are necessary on the board, such as eyes, ears, wings, etc., can be easily made, with a small carving tool, by the average sixth and seventh-grade boy.





DETAILS OF A CRYSTAL RECEIVING SET.

HEXAGONAL PAPER WEIGHT.

Kenneth R. LaVoy, Instructor in Manual Training, New Rochelle, N. Y.

This is a small machine-shop problem involving the use of the lathe, shaper, and milling machine. When completed it is a proof of the maker's skill, and a useful ornament for his desk, as well. It is a suitable problem for instructional purposes, in that it does not require much stock, covers several tool and machine processes, and has a utilitarian value.

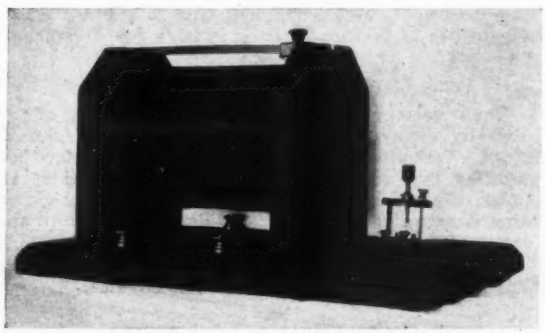
A CRYSTAL RECEIVER.

Charles Kahle, Dir. Riverside High School, Milwaukee, Wis.

This problem has been used successfully in teaching classes in first semester woodworking. It lends itself markedly to the teaching of the correct manipulation of tools and involves the use of at least twice as many tools as are necessary for an ordinary furniture problem. Electrical principles and some idea of working metal are taught in connection with the woodworking.

The base is made of two pieces, glued and dowelled. The winding is done on a lathe turned by hand. All connecting wires are concealed in one-sixteenth inch holes.

The problem is one which any boy will be glad to make as a Christmas gift for a younger brother.



THE SET READY FOR USE.

JOHNSTOWN'S VOCATIONAL SCHOOL PROGRESS.

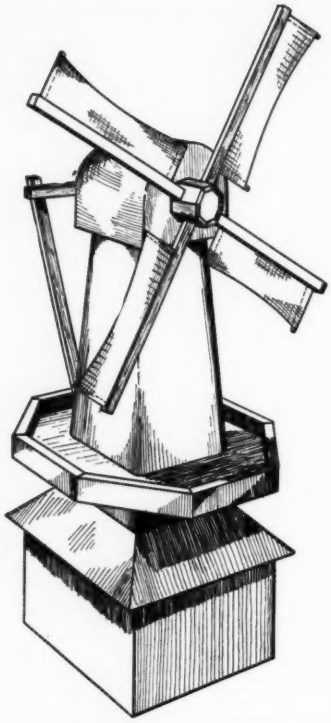
The school authorities of Johnstown, Pa., are thoroughly imbued with the importance of vocational studies and their application to the local industries. Superintendent S. J. Slawson and James Killius, the vocational director, have made a study of the possibilities for a correlation between the regular classwork and the shops.

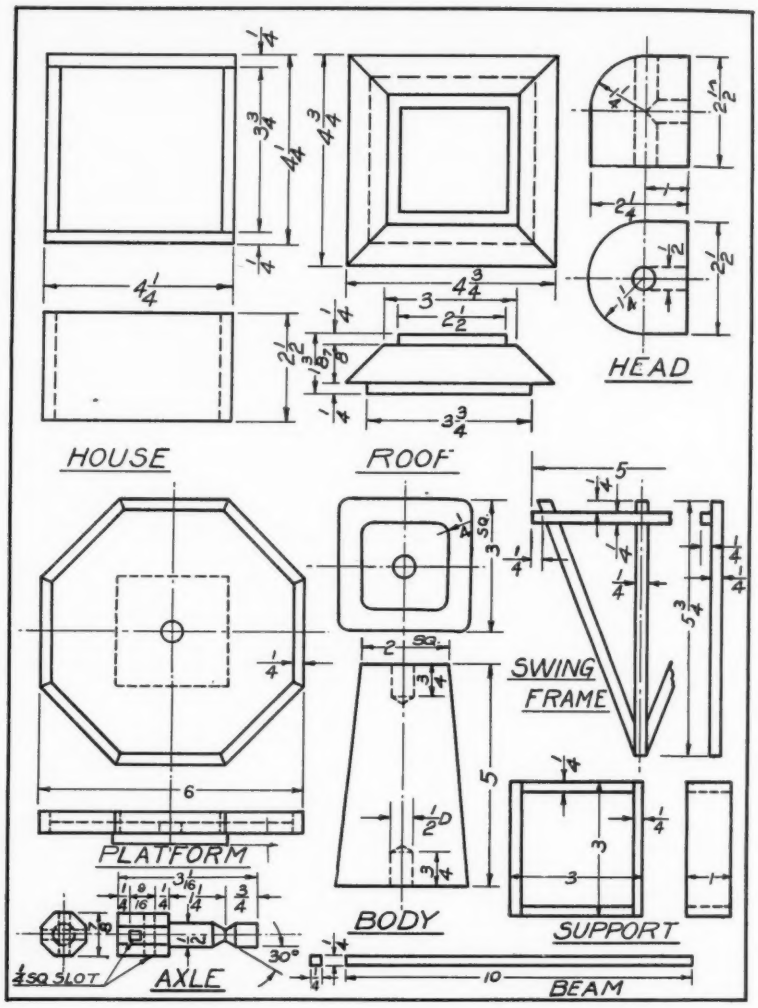
One of the features of the Johnstown schools provides that: "In the seventh grade each boy rotates through nine week tryout or experiencing periods, four hours each week, in each of the following shops: sheet metal, electrical, joinery, and mill woodwork. Along with this experience the new language of mechanical drafting is introduced and the boy is given an opportunity to answer the questions. First—am I mechanically or technically inclined? Second—in what field is my special talent or interest best shown?

"The controlling purpose is the enrichment of experiences by seeing, feeling, sampling, and doing. The secondary purposes are the production of utilities for home and school, the training toward handy man skills and interests, giving foundations for utilizer's appreciations, laying foundations for technical knowledge, providing centers of correlation for other studies, prevocational preparation, vocational finding, and physical development."

Mr. Killius, in discussing the plan, recently said: "Vocational education is here to stay, but it is not going to usurp any of the functions of the school system. Attempts to grow apart from the parent organization have resulted in failure. There is only one basis that assures success; namely, an intelligent cooperation wherein vocational education accepts its place as a part of the great educational scheme and attempts to function in relation to the other phases of education."

An Era of Mechanical "Botches." "We are living in an era that may properly be termed that of 'botches', evidence of which may be seen wherever we go." So says Mark L. Crawford in a recent issue of the Inland Printer. "Nor does it stop with the trades. The professions are full of 'botches.'" His reasons for the statement are based upon the following three reasons: 1. We have no compulsory educational system in its true sense. 2. Because we have no indenture system of apprenticeship. 3. Because parents pay no attention to their boys' tastes and natural ability.





THE TOY WINDMILL.

Wm. A. De Vette, Erie, Pa.

The toy windmill shown in the accompanying drawings is one which will prove of interest to many woodworking instructors having pupils with some experience in woodwork but who have not yet reached the furniture-making stage.

The windmill is built in seven pieces. These are not fastened together when the mill is finished but are left in the "knockdown" stage. The mill can then be assembled or dissembled at will. The axle, beams, and sails are fastened together as also the head and swing frame.

In the detail drawing all parts are shown, with the exception of the sails which may be made of any suitable cloth with a match stick sewed in each end. The matches are inserted in holes, drilled in the beams at the correct spacing, which may be determined from the length of the sails.

Some instructors may find it better to design a square platform in case the octagonal one is too difficult to lay out and construct. The eight sided platform, however, offers a very good problem in both layout and accurate planing.

This windmill, when assembled and painted, makes either a very desirable toy or a neat ornament for the home. The total heighth of the mill is twelve inches, but any instructor who so desires may change the dimensions to suit his own fancy and also his available supply of materials.

THE MEETING OF THE MAINE VOCATIONAL SOCIETY.

The Maine Vocational Society held three departmental sessions on October 25th, with Mr. Harold G. Noyes, of the Rumford Evening School, acting as chairman.

Industrial Training Section.

The first speaker was Mr. Fred P. Barker, of Brewer, who talked on "Modern Methods in Manual Training." He was followed by Mr. Arthur Hauler, of Bangor, who took for his subject, "Outlining Vocational Courses for a School System." Dr. John M. Brewer, of Harvard University, Cambridge, Mass., was the third speaker, discussing "The Relation Between General and Vocational Education." The session closed with a round-table meeting, led by Mr. Harold L. Pride, state supervisor of trades and industries.

Home Economics Section.

The home economics session was opened by the chairman, Miss Mary F. Leonard, of Lewiston. The first speaker was Miss Rubie L. Cameron, of the American Red Cross Branch, Boston, Mass., who spoke on "Possibilities of Cooperation Between the Red Cross and the Home Economics Classes." Miss Florence Jenkins, of Portland, discussed the subject, "Modern vs. Traditional Methods in Teaching Home Economics." The third speaker was Miss Helen Lockwood, of Farmington, who talked on "Some Prerequisites to Teacher-Training in High School Economics Classes."

Secondary School Agriculture Section.

The session opened, with Mr. Verne C. Beverly, of the University of Maine, Orono, in the chair. Mr. John E. Gifford, Worcester, Mass., the first speaker, talked on "Learning by Doing in Massachusetts." Mr. Lester H. Shibles, State Leader of Boys and Girls' Clubwork in Maine, discussed "The Relationship Between Clubwork and Vocational Agriculture."

The annual business meeting and election of officers followed the departmental sessions.—H. L. Pride.

PROBLEMS & PROJECTS

This department aims to present a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, pattern-making, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

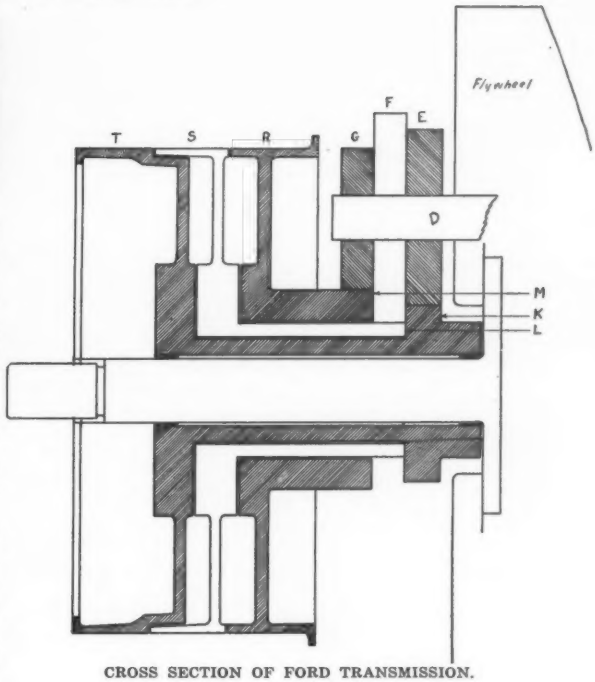
TEACHING THE FORD TRANSMISSION SYSTEM.

H. E. Randall, Instr., Selma Union High School, Selma, Calif.

The following lesson plan and illustrations have been used successfully in teaching the Ford Planetary Transmission System:

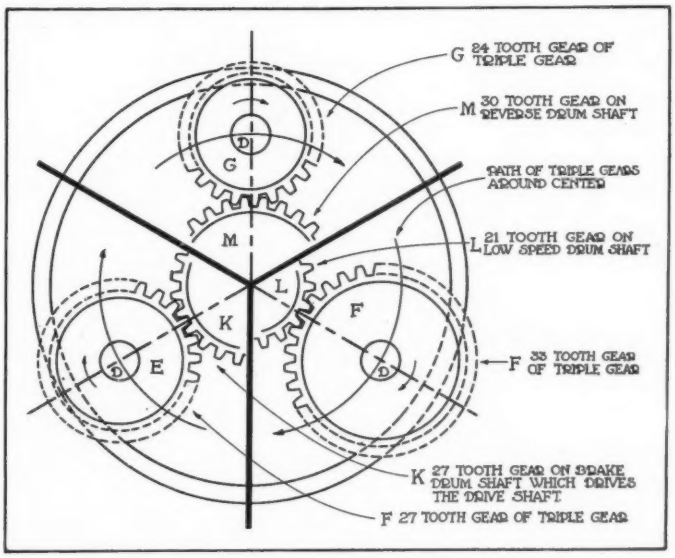
When the low speed pedal is pressed forward a band clamps the low speed drum and stops it rotating, therefore, the gear "L" on the forward end of the low speed drum shaft is stationary and gears "F" of the triple gears, which are in mesh with "L", are carried by the fly-wheel around "L". Gears "F" must rotate on the dowels "D" while they are being carried bodily around "L". During a complete revolution of the crankshaft, 21 teeth of the 33 tooth gears "F" have meshed with the 21 teeth of gear "L", therefore, gears "F" have revolved on dowels "D" a part of one rotation or 21/33 of a rotation. The ratio of the crankshaft speed to the speed of the triple gears on the dowels "D" is 1 to 21/33 or 1 to 2/3, nearly.

When the reverse peddle is pressed forward a band clamps the reverse drum and stops it rotating, therefore, the gear "M" on the forward end of the reverse drum shaft is stationary and gears "G" of the triple gears, which are in mesh with "M", are carried by the flywheel around "M", Gears "G" must rotate on the dowels "D" while they are being carried bodily around "M". During a complete crankshaft rotation, 30 teeth of the 24 tooth gears "G" have meshed with the 30 teeth of gear "M", therefore, gears "G" have revolved on dowels "D" more than one rotation or 30/24 of a rotation. The ratio of crankshaft speed to the speed of the triple gears on the dowels "D" is 1 to 30/24 or 1 to 1¼.



CROSS SECTION OF FORD TRANSMISSION.

Now that we know the speed of the triple gears in low and reverse let us turn our attention to the driving gears "E", of the triple gears, and driven gear "K", on the brake drum shaft, and it will be noticed that; if the ratio of the crankshaft speed to the triple gear speed is 1 to 1, which is the condition when the transmission is neutral, gears "E" would be carried around "K" without exerting any driving force on "K"; if the gears "E" are compelled to make less than one revolution during a crankshaft rotation so that the ratio would be 1 to 2/3 the gear "K" would be carried forward 1/3 of a revolution each crankshaft rotation; and if the gears "E" are compelled to make more than one revolution during a crankshaft rotation so that the ratio is 1 to 1¼, the gear "'K" would be carried backward ¼ of a revolution each crankshaft rotation.


G 24 TOOTH GEAR OF TRIPLE GEAR
M 30 TOOTH GEAR ON REVERSE DRUM SHAFT
PATH OF TRIPLE GEARS AROUND CENTER
L 21 TOOTH GEAR ON LOW SPEED DRUM SHAFT
F 33 TOOTH GEAR OF TRIPLE GEAR
K 27 TOOTH GEAR ON BRAKE DRUM SHAFT WHICH DRIVES THE DRIVE SHAFT
F 27 TOOTH GEAR OF TRIPLE GEAR
D
G
M
L
K
F
E

END VIEW OF FORD TRANSMISSION SHOWING HIGH, LOW AND REVERSE SPEED GEARS.

To make the action more easily understood, consider the condition for low gear again. Let the falling behind of the triple gear occur at one time, that is, let gears "E" revolve on pins "E" at the same speed as the flywheel which carries pins "D" until 2/3 of one revolution has been made and then stop gear "E" turning for the remainder of one revolution. Since the gears must stay in mesh and retain the same relative position, the gears "E" would drive gear "K" forward for 1/3 revolution to the point of beginning. Actually this is what happens but the falling back is going on all the time during a complete revolution, causing gears "E" to exert a steady pull on "K." Practically the same scheme may be used to make the reverse conditions more easily understood. Assume a one to one ratio until the crankshaft has made a complete rotation and stop the engine. During this time gears "E" have made one complete revolution on pins "D," and still have ¼ revolution to make in order to fulfill the reverse conditions. With the crankshaft stationary and the gears "E" made to revolve on pins "D" ¼ revolution forward, the gear "K" will be driven backward ¼ revolution.

Drum Gears.

Brake drum T carries gear K of 27 teeth.
Slow speed drum S carries gear L of 21 teeth.
Reverse drum R carries gear M of 30 teeth.

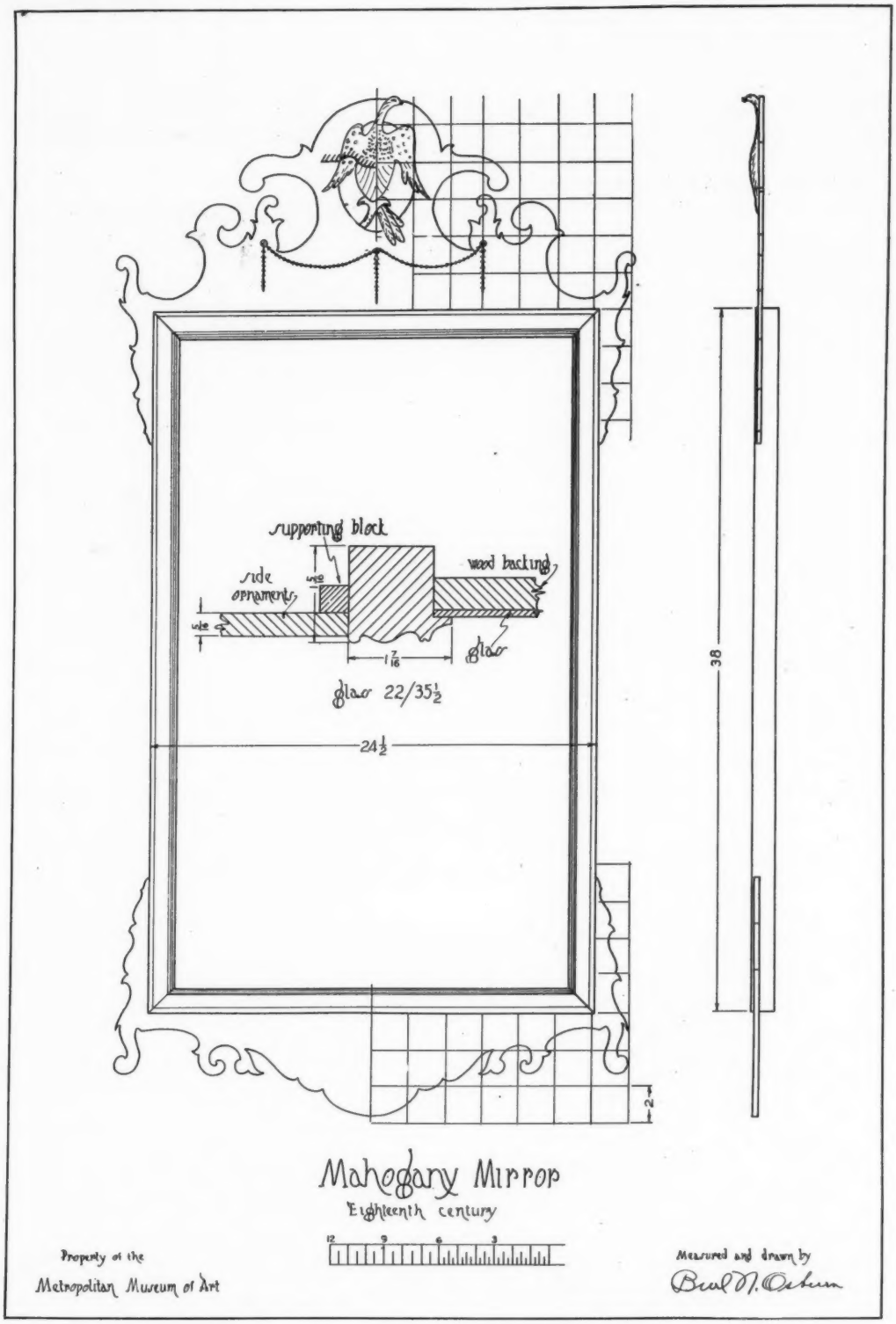
Triple Gears.

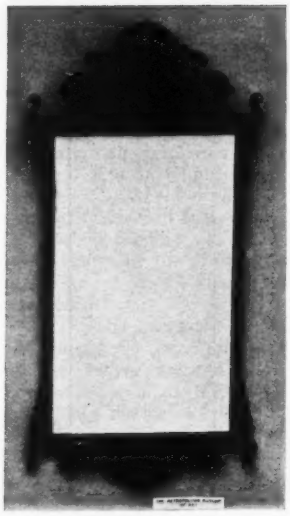
Driving gear E of 27 teeth.
Slow speed gear F of 33 teeth.
Reverse gear G of 24 teeth.

MAHOGANY MIRROR.

Burl N. Osburn, Sioux City, Ia.

"Looking glasses, the most fashionable and elegant" are very commonly found among inventories of household goods of all periods. The mirror shown here is a particularly fine example of the type common to the middle and late eighteenth century. Mirrors of the period are often valued in inventories at £ 30-80.





MAHOGANY MIRROR

The frame proper is mitered at the corners, while the graceful scrolls are attached by dowels and glue and are strengthened at the back by small square strips of wood. The eagle may be made by gluing on a block for the body and head before the pierced parts are cut out. The wings and tail are cut into the frame as shown by the section. The eagle, the swag, and the concave part of the frame next to the glass are gilded; the remainder is a dark red.

Stock Bill.

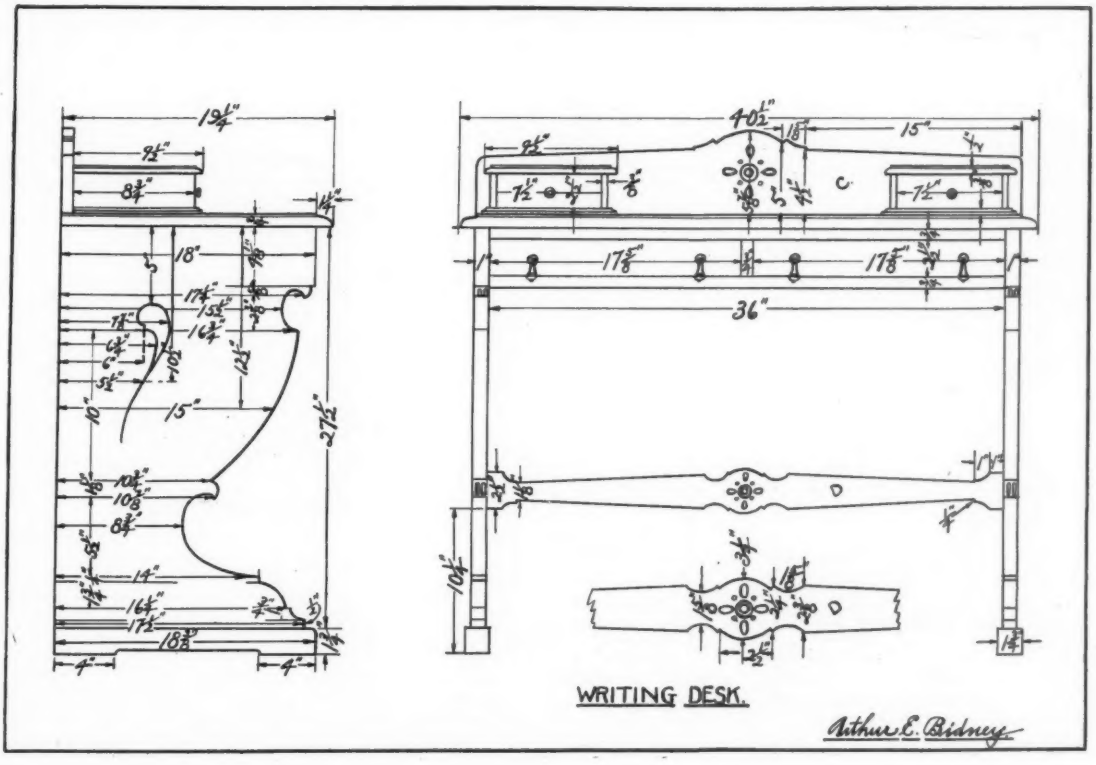
No.	Name	T.	W.	L.
1	piece moulding	1⅜	1½	11′
4	side pieces	⅜	2	12″
1	bottom	⅜	6	13″
1	top	⅜	12	13″
1	panel back (3-ply)		22	35½″
Blocks		⅜	⅜	10′

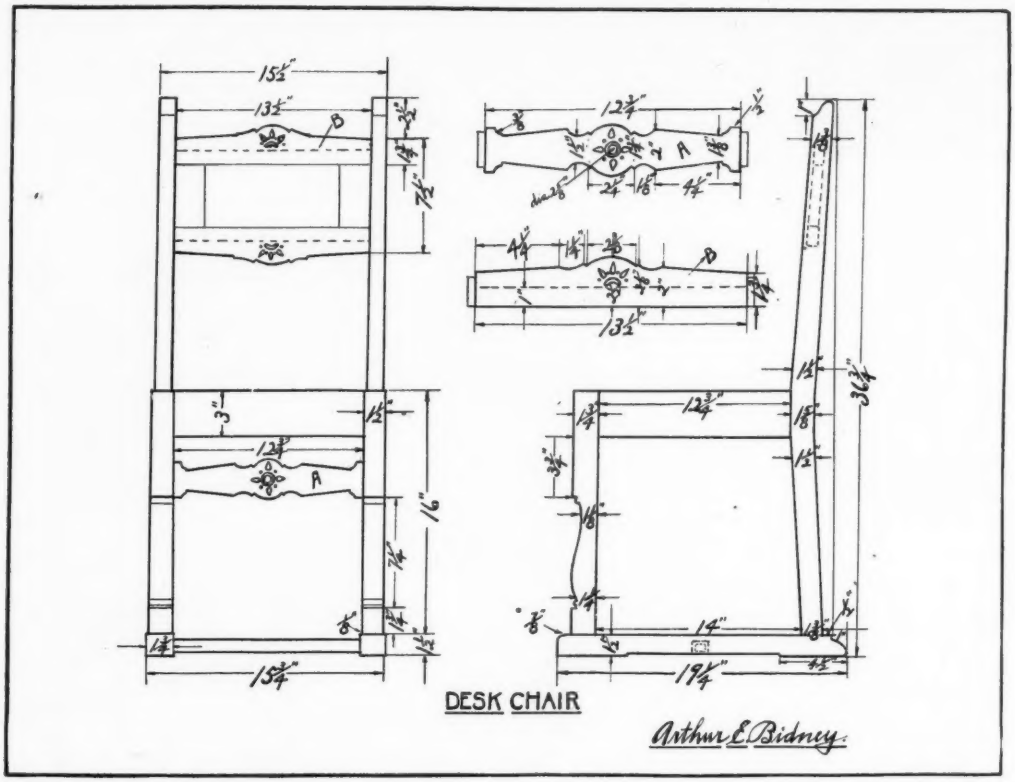
WRITING DESK AND CHAIR

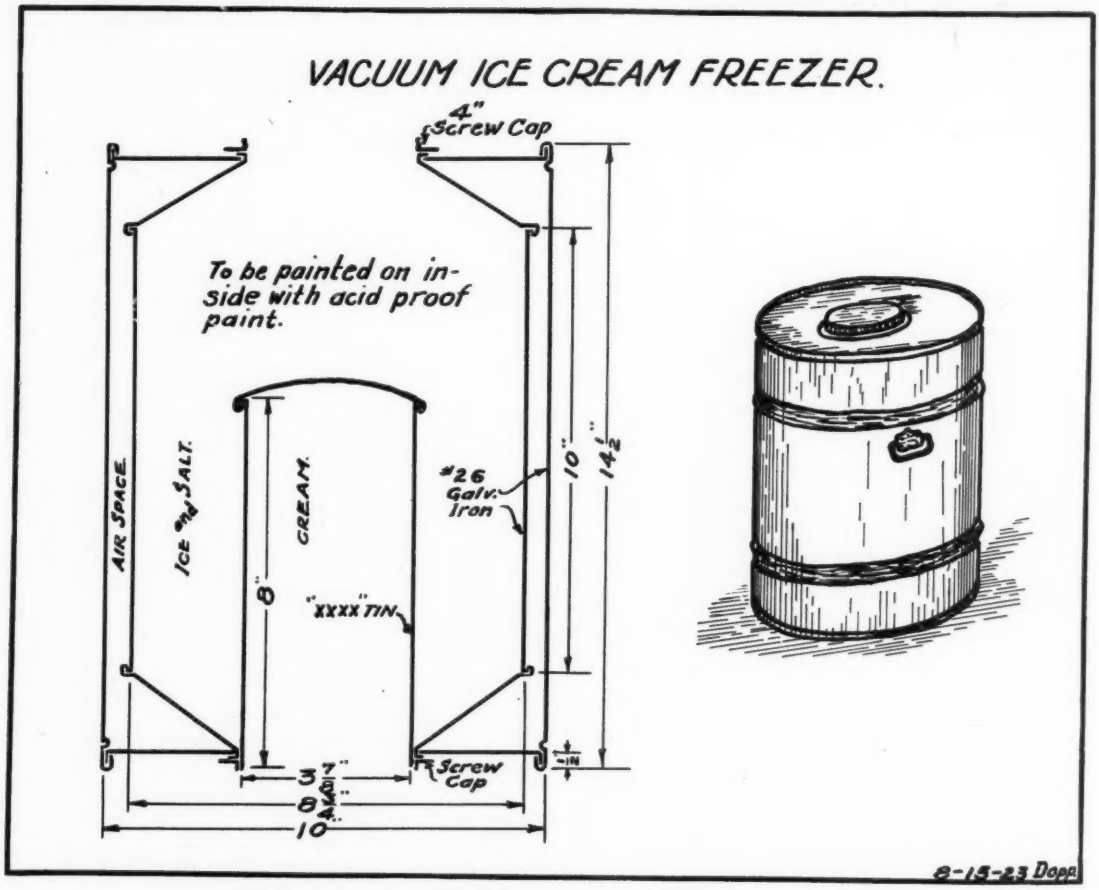
WRITING DESK AND CHAIR.

Arthur E. Bidney, Independence, Wis.

The writing desk and chair illustrated and described in this article were designed and constructed by the author. They received







VACUUM ICE CREAM FREEZER DESIGNED BY MR. W. M. WELCH, MENOMONIE, WIS.

Honorable mention at an exhibit of the Wisconsin Society of Applied Arts. The vanity dresser, the project which I submitted last month and this one will instill greater appreciation of furniture design and present a variety of operations to the student.

With the senior high school student, where the individual type of work is permitted, these two projects afford practically all problems in woodworking except woodturning. The carving is very simple but effective, being enameled with harmonizing colors, prussian blue, dark red, gold and black and then made to look antique. The general method used in the design and construction is sufficiently shown by the drawings and photograph. Of course the design of A, B, C and D can be modified or made more elaborate.

It will be necessary to make a full size drawing in order to get the extra shape of the sides and stretchers, and the proper angles in the chair. They were constructed of birch and were stained a dark mahogany, varnished, and rubbed to a stain finish. If walnut or mahogany is available by all means use either one as then you have the real article and not an imitation. The Italian finish would make a very fine finish if they are used. Webbing, springs, curled hair and burlap were used in the upholstery of the chair and the final covering was a good grade of tapestry.

The candle sticks and desk set shown in the photograph were also designed and made by the author.

THE NEWARK MANUAL ARTS PLAN.

The Newark, N. J., board of education has just issued a brochure on its intensive plan of teaching the manual arts. In presenting the same, Superintendent David B. Corson explains that while marked progress had been made in cultural courses for two decades, the manual arts hang largely upon their original organization.

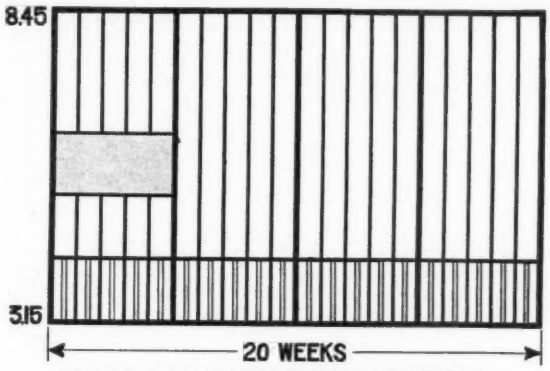


CHART I. COMPARISON OF TIME DISTRIBUTION.

	1ST CYCLE	2ND CYCLE	3RD CYCLE	4TH CYCLE
8.45		ARITHMETIC	AND CIVICS	
9.45	MAN. TR.	MUSIC / PEN.	ART	MUSIC / PEN.
10.45	ENG	LISH AND	SPELLING	
11.45		NOON	HOUR	
115	HIS	TORY AND	GEOGRAP	HY
2.15	REA	DING AND	GYMNASIU	M
3.15				

CHART II. TYPICAL CLASS PROGRAM.

In recognition of this fact Mr. Corson in 1919 sought a remedy. He authorized Allen D. Backus, supervisor of manual training to test out a more intensive plan, a lesson every day for a sufficient number of days to cover the amount of time allotted to the several manual arts.

	1ST CYCLE	2ND CYCLE	3RD CYCLE	4TH CYCLE
9.00		ARITHMETIC 45 MINUTES		
	GEOG	RAPHY AND NAT PENMANSHIP PHYSICAL TRAIN	URE STUDY 21 M 12 MINUTES ING 12 MINUTES	INUTES
10.30	MECHANICAL ARTS AND COOKING	ART / MUSIC / CIVICS	MECHANICAL DRAWING AND SEWING	ART / MUSIC / CIVICS
12.00		NOON	HOUR	
1.00	PHYSIO	ENGLISH LOGY AND	81 MINUTES HYGIENE 9	MINUTES
3.00		HISTORY 2	0 MINUTES	

CHART III. INTENSIVE PROGRAM.

CLASS ASSIGNMENTS

	8A	8B	7A	7B
8.45	M.T. / MUSIC / PEN. — ART — MUSIC / PEN.	MUSIC / PEN. — M.T. — MUSIC / PEN. — ART	ART — PEN. / MUSIC — M.T. — PEN. / MUSIC	PEN. / MUSIC — ART — PEN. / MUSIC — M.T.
9.45	ARITHMETIC–CIVICS	HISTORY–GEOGRAPHY	ENGLISH–SPELLING	ENGLISH–SPELLING
10.45	ENGLISH–SPELLING	ARITHMETIC–CIVICS	HISTORY–GEOGRAPHY	HISTORY–GEOGRAPHY
11.45	ASS	EMBLY THREE A WEEK AND	HYGIENE THREE TIMES A WEEK	
1.15	HISTORY–GEOGRAPHY	ENGLISH–SPELLING	BOYS–READING / GIRLS–READING	GIRLS–GYMNASIUM / BOYS–GYMNASIUM
2.15	BOYS–READING / GIRLS–GYMNASIUM	BOYS–READING / GIRLS–GYMNASIUM	ARITHMETIC–CIVICS	ARITHMETIC–CIVICS
3.15	GIRLS–READING / BOYS–GYMNASIUM	GIRLS–READING / BOYS–GYMNASIUM		

TEACHER ASSIGNMENTS

	SUBJECTS: HISTORY–GEOGRAPHY AND MUSIC	SUBJECTS: ENGLISH–SPELLING AND PENMANSHIP	SUBJECTS: ARITHMETIC–CIVICS AND ART	SUBJECTS: OWN MAJORS AND SEWING
8.45	8B 8A 8B 8A / 7B 7A 7B 7A	7B 7A 7B 7A / 8B 8A 8B 8A	7A 7B 8A 8B	8B — 7B
9.45	8B HISTORY–GEOGRAPHY	7A ENGLISH–SPELLING	8A ARITHMETIC–CIVICS	7B ENGLISH–SPELLING
10.45	7A HISTORY–GEOGRAPHY	8A ENGLISH–SPELLING	8B ARITHMETIC–CIVICS	7B HISTORY–GEOGRAPHY
11.45		ASSEMBLY AND HYGIENE		
1.15	8A HISTORY–GEOGRAPHY	8B ENGLISH–SPELLING	7A READING–BOYS / 7A READING–GIRLS	7B READING–BOYS / 7B READING–GIRLS
2.15	8A READING–BOYS	8B READING–BOYS	7A ARITHMETIC–CIVICS	7B ARITHMETIC–CIVICS
3.15	8A READING–GIRLS	8B READING–GIRLS		

CHART IV. INTENSIVE PROGRAM FOR 4-CLASS UNIT.

The results obtained under the intensive or day plan, as compared with those obtained under the weekly plan, were so remarkable that in 1920 Mr. Corson extended the plan to all the schools.

The brochure prepared by Mr. Backus presents several charts demonstrating the plan. Chart I shows a comparison of the distribution of time. In this chart the vertical dimension represents the school day, while the horizontal dimension represents a term of twenty weeks. The dotted areas show the time given to any one manual art. The small ones at the bottom of the chart show this subject covering a period of twenty weekly lessons, whereas the large rectangle above shows the same time given every day for one-fourth of the term. Each term is thus divided into cycles which constitute the period given to any manual art during a term.

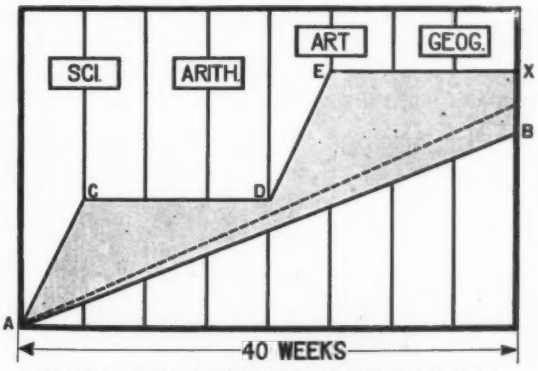
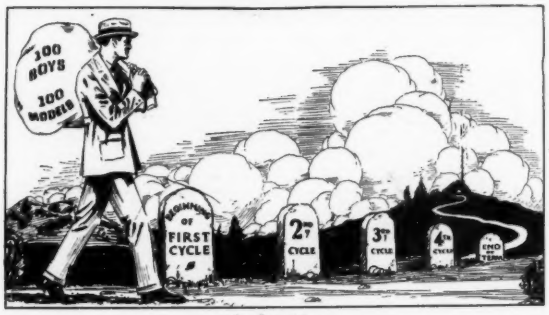


CHART V. SKILL ATTAINMENT VS. ENRICHMENT OF SUBJECT MATTER.

Chart II shows a class program for an entire term worked out on the basis of time allotments and groupings. It will be noted in Chart III that the program based on an eight grade provides for more time in manual arts. Chart IV recognizes the departmentalized unit.

THE TRADITIONAL PLAN



THE NEWARK PLAN

CARTOONS USED TO CONTRAST THE TWO PLANS.

In Chart V the dotted line represents the skill attainment in any manual arts activity for the average boy or girl in any grade over a school year of forty weeks when the subject is presented in weekly periods. This is, of course, an arbitrary line and shows a steady gain in skill from the beginning of the year to the maximum possible to grade at the end of the year. The skill attainment shown by the dotted line being the maximum possible under the best conditions will rarely be attained. The weekly review, loss occasioned by holidays, and the overloading of the instructor will tend to pull this line down until the actual skill developed might be represented by the heavy line A-B.

The allegorical illustrations are, of course, designed to contrast the Newark plan with the traditional plan.

MINNESOTA INDUSTRIAL TRAINING CONFERENCE.

An industrial training conference was held on Friday, October 5th, in connection with the meeting of the Northwestern Division of the Minnesota Education Association.

The main speaker of the day was Mr. C. W. Pope of Thief River Falls, who gave a very thoughtful discussion on New Aspects of General Industrial Training. In his talk, he pointed out that the instructor should not remain in the rut of teaching only woodwork but that he should teach other things such as elementary electric wiring, sheet metal work and the more recent innovations. Some time was given to the discussion of methods of teaching shopwork and the problems confronting the instructor of manual arts.

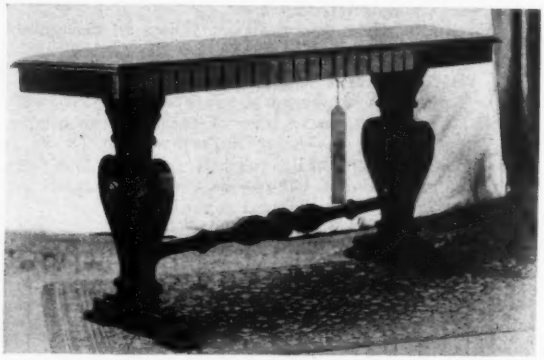
Those present at the meeting and taking part in the discussions were: Messrs. C. W. Pope, Thief River Falls; Voorman, East Grand Forks; Johnson, Fosston; Barr, Red Lake Falls; Collette, Warren; Kittleson, Crookston; Jackson, Crookston, and Cunningham, Fisher.

INDIANA SOCIETY MEETS.

The Indiana Society for Vocational Education held its annual convention on October 18th and 19th in connection with the State Teachers' meeting. A dinner for the friends of vocational education preceded the annual business session. Sectional meetings devoted to industrial arts, automobile mechanics, electricity, drafting and machine shop practice were held. Teachers of vocational agriculture and of household arts held separate meetings. The speakers included Dr. V. E. Deam of Columbia University, Prof. J. C. Miller of Indiana University and Miss Bertha Latta of the state office.

WIN PRIZES.

The industrial-arts department of Winfield, Kansas, has won nine prizes for furniture construction at the International Wheat Show, September 24th to October 6th at Wichita, Kans. The Winfield boys received more prizes than all the other contestants put together. The work was done under the direction of Mr. L. H. Alberty and represented the best pieces made by classes including 375 boys.

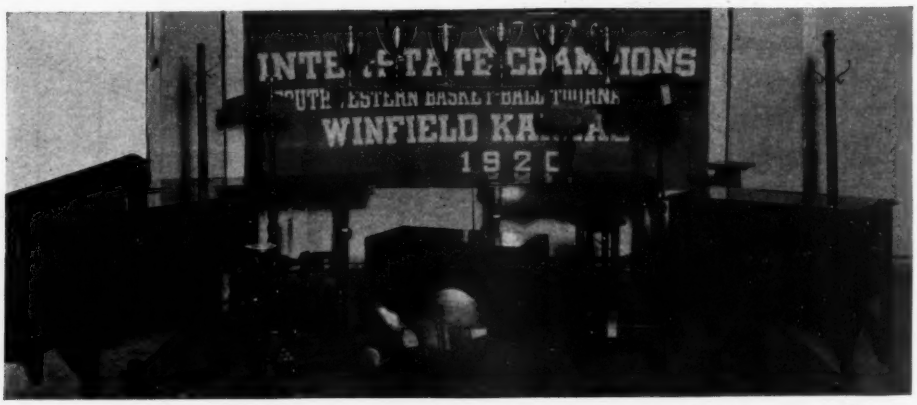


A PRIZE WINNING TABLE.

The Winfield high school received the $50 sweepstakes prize and individual boys received four first prizes, three second prizes and one third prize. Of the accompanying cuts the davenport table received the first prize. It was made by Russell Nelson, a student. The second picture shows a number of the pieces which were entered in the exhibit and which won the sweepstakes prize.

Teaching Positions Open. Examinations for teachers of Woodworking including Cabinetmaking and for teachers of Mechanical Drawing, for positions in the Wm. L. Dickinson High School of Jersey City, N. J., will be given by the Board of Examiners on Saturday, December 29th.

Teachers interested in taking these examinations will communicate with Mr. E. A. Murphy, City Superintendent of Schools, as soon as possible. Application blanks must be filed before December 22nd.



SOME OF THE PRIZE WINNING PIECES OF FURNITURE MADE BY THE WINFIELD, KANS., SCHOOLS.

OCTOBER MEETING OF THE SCHOOL CRAFTS CLUB.

Arthur F. Hopper, director of industrial and fine arts, Plainfield, New Jersey, spoke on the topic of The Future of Manual and Industrial Arts in This Country, before the October meeting of the School Crafts Club held in the Ethical Culture School, New York City, on Saturday evening, October 20. The meeting was called to order by Mr. Philip M. Wagner, president.

Mr. Hopper is unshaken in his belief that the practical phases of education will become more and more valuable, as the forces behind them strive for stronger organization and for factors toward betterment. He has tried to analyze the manual arts situation in the future. In the next few years we can expect a lot of criticism. There is an attitude on the part of political men to slash some of the educational budgets. Is retrenchment necessary? No! People are living upon a much higher standard, paying greater amounts of money for luxuries, on things formerly done without by the man of ordinary means. Manual arts work is costing about one per cent of the total spent for education, the cost of which is insignificant beside the amount spent for luxury.

There are many influences which we must not overlook. Much can be said regarding the fickleness of the American public. Ten years ago manual arts had a big boom. This subject was wanted by the public, and was favored by industry and the teaching corps. Why are the people quiet now? Why are they allowing this knocking? Back in 1883, many men high in education strongly advocated our work. Where are they today? Now a great many big men believe in the manual arts but we must get them to actively back our movement. New leaders must put our cause before the public.

We must have better trained teachers in our subject. No longer should we rely on men directly from the trades but all shop teachers should be on an educational footing inferior to none of their associates. The untrained man is not dependable when trouble comes and a crisis arises. Furthermore parents must be made to understand what it is that we are trying to do for their boys. Initiative development is bringing less skill and technique in the article which is taken home. Unless the parent understands the aim of the teacher he is liable to take a critical attitude.

DR. W. T. BAWDEN,
Assistant Superintendent of Schools,
Tulsa, Okla.

Also we need the backing of local clubs, associations and industries. Our state and county organizations could be brought to do more for manual arts. Our N. E. A. has had no manual arts in its program for the last two years.

A scientific analysis leading to definite aims and purposes is greatly in demand. Much of the research work that has been done is only on paper and is not functioning in the hearts of manual arts teachers. Our subject is thoroughly correct, now we must have strong support and we must use all possible influences for its improvement.

In the discussion which took place following Mr. Hopper's talk, Mr. Edward A. Reuther, supervisor of continuation schools for the state of New Jersey, took an active part. He said that the organizations in his state have waged a strong fight for the good of manual arts. Vocational Education no longer overshadows manual arts, for now that the aims of each are established.

FRANK H. SHEPHERD,
Chicago, Ill.
Mr. Shepherd has become head of the Department of Industry of the Association for the Hard of Hearing.

The following men were accepted into membership: Alexander McIntosh, Manhasset, N. Y., and John Mulholland, New York City. The officers for the ensuing year were elected and will be installed at the November meeting. Mr. Edwin F. Judd of Montclair, New Jersey, is the incoming president. A motion was read to reduce the number of our meetings to six each year, coming on the Saturday of the months November through April. This will be voted upon at the next meeting.—**Lloyd F. Stair.**

DR. BAWDEN TO TULSA.

Dr. William T. Bawden, specialist in industrial education in the United States Bureau of Education, and assistant to the commissioner of education, has accepted an appointment as associate superintendent in charge of vocational education, manual training and evening schools at Tulsa, Okla.

Dr. Bawden is a native of Ohio and received his early professional training at Denison University and Mechanics Institute, Rochester. He taught successively in the elementary schools of Ohio, in the Elmira, N. Y., Reformatory, and in the schools of Buffalo, N. Y. In 1902 he received his bachelor's degree in manual training and the degree of bachelor of science. From 1903 to 1910 he was head of the manual training department of the Illinois Normal School at Normal, and from 1910 to 1912 was assistant dean of the College of Engineering, University of Illinois. In 1914 he received the degree of doctor of philosophy from Columbia University, for special work in industrial education. Dr. Bawden was appointed specialist in industrial education for the Bureau of Education in 1914, and since 1919 had acted as assistant to the commissioner of education. He has been active in a number of school surveys in the field of vocational education and has held important offices in the state and national organizations connected with manual training, vocational education and allied school fields.

TITLE PAGE AND INDEX.

The title page and index for Volume XII of the Industrial-Arts Magazine embracing the issues for the year 1923 has been prepared and will be sent gratis on request to any reader who desires it. Applications should be addressed to the Subscription Department, Industrial-Arts Magazine, Milwaukee, Wis.

COLOR AND DESIGN.

The following outlines of a course in color and design, copyrighted by Marguerite Marquart, supervisor of drawing in alternating schools, Newark, N. J., should prove of value to teachers of children in the transition and formative stages. The suggestions given under "transition stage" were supplementary to the talk of the Superintendent in September; and those under "formative stage" were supplementary to the talk given in October.

Transition Stage (Kindergarten, First and Second Years).

In presenting color to the youngest children one must keep constantly in mind the fact that the purpose of art is to give joy. One should seek only to delight with color—"make their first vision glorious."

No effort on the part of the teacher is required, for the children instinctively love color; it is necessary only to supply appropriate color experiences.

How is this to be done? The first glance in the room should give color joy—the draperies, pictures, flowers, properly selected and arranged cannot fail to secure the desired response.

Next to the atmosphere of the room it is most desirable to supply beautifully illustrated books as well as attractively colored toys.

After that comes the material with which the children construct things. As we proceed to material which admits of color combinations, it is essential to limit their choice to right combinations.

The colors of materials used—the combinations the teacher makes possible should be those which are characteristic of an artistic home.

In Design also an indirect method of procedure should be followed. The first law of Design is order, and may be suggested by the orderly arrangement of the Kindergarten chairs, or a regular alternation of any selected shapes or color.

By adding stems and centers to a row of little paper circles a flower border may be made.. A concrete idea of form has thus developed from an orderly abstract arrangement.

By stressing the **arrangement** rather than the product a foundation for Design Study may be laid.

While there should be as much freedom of choice and opportunity for individuality as possible, by limiting the child's ability to make mistakes we may indirectly create correct standards, and can gradually lead him to work with a definite and intelligent purpose.

Formative Stage (Third, Fourth, Fifth and Sixth Years).

The indirect method of teaching Color and Design by limiting the beginner's choice to correct combinations, changes in the second period of child growth, to a more direct procedure.

The beginning of this period finds the child with his experiences largely those of the senses—**Color** is seeing, as **sound** is hearing.

As his sense stimulation continues the pathways deepen through the sense areas in his brain—associations are formed which very quickly develop into Habits.

The formation of correct **habits** of the use of color, line, and proportion, supplementing the correct color and design sensations of the first period constitutes our whole duty in Art teaching.

The method used in the second period should be a concrete basis for every presentation, and sufficient emphasis on the essentials as they reappear in the various problems to insure the formation of correct Habits.

The first step in the formal teaching of color is learning the effect of one color upon another. Red added to Yellow makes Orange. Blue added to Yellow makes Green. Red added to Blue makes Violet. The property of color which **names** it is called Hue; as: The Hue of the ribbon is **blue.**

The second step is the modification of both Primary and Binary colors by adding white (or water) to make Tints, and black to make shades.

The property of color which denotes its **lightness** or **darkness** is called Value; as: The ribbon is **light** blue.

The third step is the combination of all three Primaries in such proportions as to complete, or neutralize each other, or to produce Neutral Gray. The complement of every Primary is the Binary made of the other two Primaries. A color may be grayed or made less intense by the addition of its complement; therefore all grayed colors have three primaries present but with **one** color predominating.

The property of color which relates to its strength or brilliancy is called Intensity; as: The ribbon is light grey blue.—Newark School Bulletin.

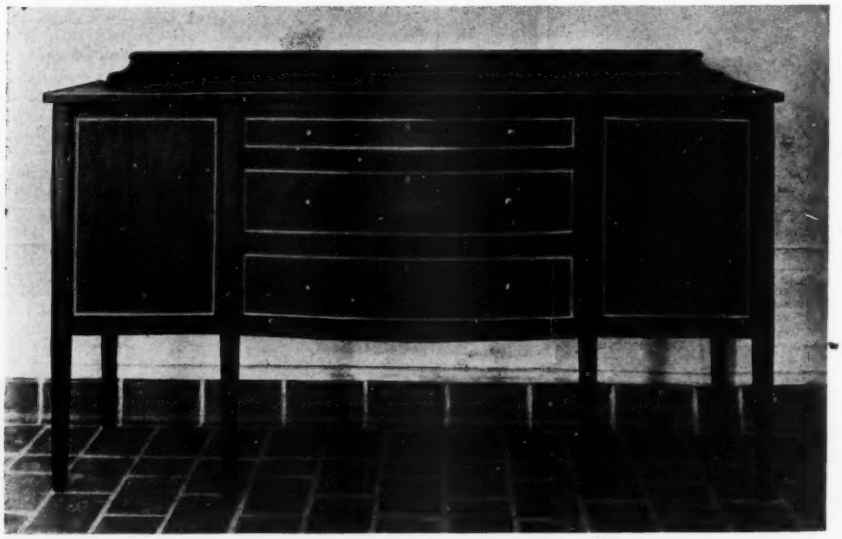
Note—1. One strong color with a neutral—black, white or gray. 2. All primary colors with much neutrality. 3. All binary colors, together with neutrals or singly with the primary, not contained in itself.

THE BELMONT VOCATIONAL SCHOOL, CHARLOTTE, N. C.

Mr. H. K. Moore, Charlotte, N. C.
The Vocational School.

The Belmont Vocational School is located in Belmont, an industrial suburb of the city of Charlotte, North Carolina. The structure is of fireproof construction and is surrounded with five and one-half acres of land. The building contains fifteen classrooms, manual training and domestic science departments, and commercial training rooms.

The vocational work of the seventh and eighth grades this year has been carried through the manual training and domestic science departments. These two phases of the work have been made possible by thoroughly modern equipment in both departments. The domestic science



SIDEBOARD MADE BY NINTH GRADE BOY AT THE BALDIORITY DE CASTRO TECHNICAL SCHOOL, SAN JUAN, P. R. JULIAN C. ARMSTRONG, INSTRUCTOR.

room is equipped with strictly modern electrical appliances. A model kitchen and dining room, a large kitchen and a sewing room make up the rooms devoted to this department.

The manual training department has benches to take care of twenty boys to the class. A tool room was built by the boys wherein all tools are kept and properly checked out. The machines include a mortiser, a saw bench, a band saw, a planer, a jointer, a power grinder, five lathes all electrically driven. The lathes are motor in head with a polishing speed of 3,450 revolutions per minute.

The first year of manual training takes the form of exploratory work in which little skill is demanded. Each boy is required to sketch and to prepare a working drawing of each article he desires to make. In choosing a project, the boy is encouraged to select something which will supply a distinct need, something that he is really interested in from a mechanical standpoint. The project method is followed entirely in the first year's work.

Some of the more recent innovations have been the inauguration of classes in the trades of plumbing, carpentry and mechanics. Extensive plans for the future involve the provision of opportunities for the training of boys and girls from the seventh grade up through the high school, drawing students from all over the city who find it inconvenient to continue through college. The entire site, it is expected, will be finally consumed in the erection of shops for the use of the several trades.

The Opportunity Classes.

The opportunity classes were given their first trial during the scholastic year 1921-1922 in the third ward school. The demand for this kind of a class was the reason for its establishment, since the grade teachers recognized that each child must be assisted, and in providing for the best development of the individual, in bringing his talent into service. The work in the classes is fitted to the pupil, no effort being made to fit the pupil to the work. Perfect freedom is allowed each pupil and plenty of work is allotted each student.

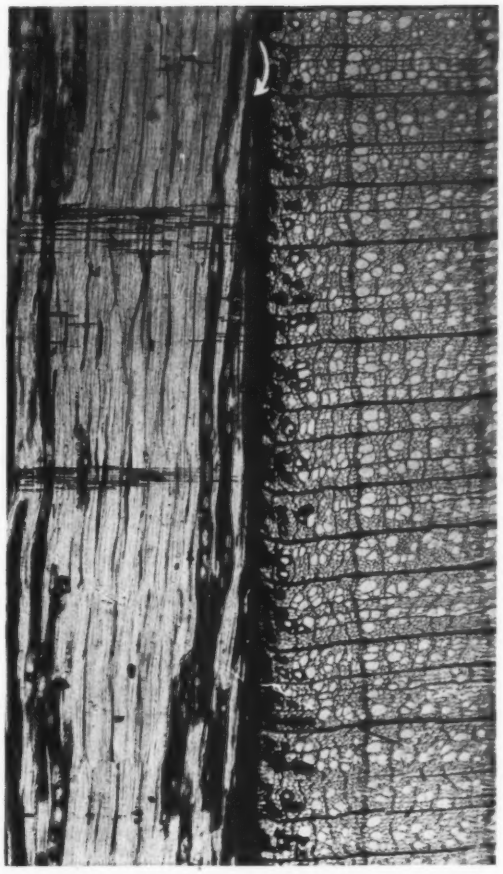
The classes are composed of the motile types of children. They consist of children who cannot master history, geography, English or some other grade studies well enough to pass the regular examinations. Fair and complete tests of these boys and girls reveal oftentimes that they are "shining marks" in the field of mechanical or industrial work. The boy who ranks 90 per cent in mechanical or industrial work and 60 per cent in school work is a good risk for society. His real worth should have higher recognition both in school and out.

TENTH ANNUAL CONVENTION OF THE VOCATIONAL EDUCATION ASSOCIATION OF THE MIDDLE WEST — ST. LOUIS.

January 16-17-18-19, 1924.

Advance information indicates that the next meeting of the Vocational Education Association of the Middle West will equal that of any previous meeting. All the educational forces of St. Louis and of the State of Missouri are lending their support to the officers of the association in making the program a success. This association, in the ten years of its existence, has won an enviable place in the educational field. It has supplied each year to the Middlewest a stimulating convention which has had a great influence on the work in this territory. Individuals in increasing numbers from outside the territory considered the Middle-west, have been attending these meetings. The value of this association in guiding and encouraging vocational education is evidenced by the selection of the President of the Association, Mr. John N. Greer, Assistant Supt. of Schools, Minneapolis, to the additional responsibilities of Chairman of the Vocational Section of the Department of Superintendence and Chairman of the Vocational Section of the N. E. A. Never before in the history of vocational education has one man held so important a position in directing three important meetings during the year.

Supt. Maddox, of the Public Schools, and Lewis Gustafson, of the David Ranken, Jr., School of Mechanical Trades are directing the work of the local committee in St. Louis, and they have the support of all the educational forces of the city and the backing of a very active public bureau. The new and splendid Hotel Chase, which is admirably adapted to holding a convention, has been selected as headquarters.



This greatly enlarged section through a glued joint of plywood illustrates a fact not generally understood, that the glue uniting two wood surfaces does not lie in a smooth sheet but enters the cell cavities through the open ends on the cut surface and clinches the joint by means of millions of tiny barbs and anchors. The arrow indicates the point at which the glue enterd the pore to the left of glue line. The glue-filled pores near the glue line on the right all open on the cut surface at some point and were filled in the same manner, as little or no penetration takes place through the cell walls. Viscosity and pressure must be adjusted to suit the character and number of cells and pores in different kinds of woods to obtain the strongest joint. —Photograph by the U. S. Forest Service.

For advance information, railroad fares, and other information, a letter to the Secretary, Leonard W. Wahlstrom, 1711 Estes Avenue, Chicago, will bring a prompt reply.

TRADE SCHOOL PRINCIPALSHIP REQUIREMENTS.

The board of examiners of the New York City school system has announced that it will require applicants for trade school principalships to give detailed information on the following:

I. Academic Education.

II. Professional Education—(a) non-vocational; (b) vocational; (c) special investigation.

III. Teaching Experience—(a) non-vocational teaching; (b) non-vocational supervision; (c) vocational teaching; (d) vocational supervision.

IV. Trade Experience—(a) journeyman; (b) supervision.

Alternating Shop Classes. At the East High School, Erie, Pa., two automotive repair and two machinist trade classes have been organized on the alternating plan. First year and second year students exchange places each week, alternating between shop work and school activities.

Auto-Mechanics Department. A department of auto-mechanics and electricity has been organized in the high school at Logansport, Ind. Mr. William Middleton is the instructor.

NOW ARE THERE ANY QUESTIONS?

Polychrome Work.

383. Q: I should like some definite directions on the polychroming of wooden objects. I have followed Waldcraft directions but the colors are all luster and they give no instructions for dulling.—H. T.

A: Polychrome treatments may be made dull or "flat" as the term is used in the trade by one of the following three treatments, each of which gives an individual color tone and depth. First, by the use of colors ground in japan and thinned with turpentine only. In this treatment the prepared color is mixed very thin with pure turpentine, applied with a soft rabbit hair water color brush and allowed to dry untouched. The second treatment is obtained by using the colors ground in oil and thinned with turpentine as above. When hard and dry they are given a thin coat of flatting varnish, reduced one-half with turpentine. This material must be applied quickly and evenly with a soft Fitch brush in order to avoid lifting any of the polychrome colors. This produces an entirely different effect than do either of the other treatments. A slightly different result can be obtained through the use of a so-called eggshell varnish where there will be a semi-gloss result.

"The treatment most frequently used because of the ease with which it can be renovated and cleaned consists in the use of ordinary laundry starch applied over the thoroughly dried polychrome colors. Ordinary lump laundry starch should be beaten up smooth with cold water and then brought to a clear and rather thin condition by boiling water, stirring constantly. Do not attempt to apply any cold water or uncooked starch which will simply dust off. Apply the starch when cold with a soft water color brush and allow to dry. This can be easily removed with warm water and a sponge at any time and a new treatment given, since the starch will readily hang on to the dirt and soil of handling, thereby enabling it to be easily removed with a sponge. It should then be given a fresh coat of starch."—Ralph G. Waring.

Plaster Casting.

390. Q: I would like to obtain some information in regard to making plaster molds.

A: Consult a copy of "Plaster Casts and How They Are Made" by Frank Forrest Frederick, $1.50. Published by Wm. T. Comstock, 23 Warren Street, New York City.

Working Drawings for Canoe.

411. Q: Where can I get working drawings for an eighteen-foot canoe?—G. W. S.

A: Directions and working drawings for various sizes of boats may be obtained from Stephens' "Boat Building Plates," published by the Forest & Stream Publishing Co., 9 East 40th St., New York City.

KANSAS INDUSTRIAL ARTS TEACHERS' MEETING.

The industrial arts teachers of Kansas held a meeting on October 18th, at Wichita, Kans., in connection with the annual meeting of the State Teachers' Association. The meeting was opened by Mr. O. B. Badger, supervisor of industrial arts at Wichita. Supt. C. E. St. John, of Arkansas City, who was the first speaker, talked on the subject, "When is a Manual Arts Teacher One Hundred Per Cent Efficient?" Mr. St. John is a believer in the industrial arts and recognizes the important place it holds in the educational program of the present day. Mr. L. H. Alberty, of Winfield, took for his subject, "The Supervision of the Industrial Arts." Mr. Alberty, who is considered an expert on finances, presented ideas and plans of great value in improving the present methods in use in the schools. The third subject "Industrial Education and Its Relation to the Low I. Q." was handled by Mr. Lewis Gustafson, President of the David Ranken School of Mechanical Trades, St. Louis, Mo. Mr. Gustafson's talk applied to all industrial education and vocational or trade training schools. He discussed tests and measurements and gave some attention to the weight they should have with members of the teaching profession. Mr. DeArmond, of El Dorado, gave an address on the subject "Outlining Drawing Courses for Elementary and High School Pupils." Mr. J. A. Sinclair of Caldwell, followed with a paper on "The Problems of the Town of 2200 Population." Mr. Sinclair's talk was based on the problems of the rural town and sought to prove the justification of industrial-arts teaching in these schools. Prof. C. R. Wasser, of Kansas Teachers' College, Pittsburg, who was the next speaker, talked on "Historical Landmarks in the Field of Industrial and Vocational Education." He traced the development and the progress of the schools of today and lauded the men in the field for their professional stand and their part in the development of the present day system. At this point, President Gustafson, of the Ranken Trade School, in a second talk, maintained that all shops should make their contact with the industries. He pointed out that the first manual training schools were established with the trade idea in mind, and he emphasized that the slogan should be "send the whole boy to school," as emphasized by Mr. Woodward, the first manual training exponent in this country. He mentioned the popularity of automobile work and pointed to the many advance movements in vocational education. He offered many ideas for the help and encouragement of industrial arts teachers.

The meeting closed with the adoption of a resolution requesting the state board of education to inaugurate a policy whereby teaching requirements for industrial teachers shall be made more strict. At present any person with a degree may secure a teaching position even though he may be unprepared for industrial arts teaching.—D. A. Sloan.

Northeast Ohio Meeting. The Industrial Arts Section of the North East Ohio Teachers' Association held a meeting on November 2 under the leadership of Mr. Frank C. Moore. The topics scheduled for discussion were (1) the present trend in industrial education and (2) industrial education from the employer's viewpoint.

UPPER PENINSULA MEETING.

The meeting of the Manual and Industrial Arts section of the Upper Peninsula Educational Association was held on October 10th under the leadership of Mr. R. D. West, Menominee, Chairman. The meeting resolved itself into a round table discussion, in which manual arts teachers, directors, supervisors, principals and superintendents of the schools took part. The topic of discussion was the future policy of the state of Michigan in the development of industrial and vocational education. Mr. K. G. Smith, state director of vocational education led and emphasized the necessity of good manual arts work as the foundation for successful vocational training. Mr. John B. Gallup, state director of agricultural education discussed cooperation between instructors of manual arts and instructors of agriculture, who are operating classes under the Smith-Hughes law.

On Friday afternoon October 12th, the Industrial Arts Section held a meeting for the discussion of problems of teaching. Mr. Frank Martin of the Marquette Normal School discussed the value of home mechanics and gave concrete examples of courses of study and subjects to be taught.

Mr. Langdon Foard, director of manual arts in the Marquette high school spoke on cooperative high school courses and presented the valuation and methods of the cooperative part time work as it is being carried on in the Marquette high school and local shops.

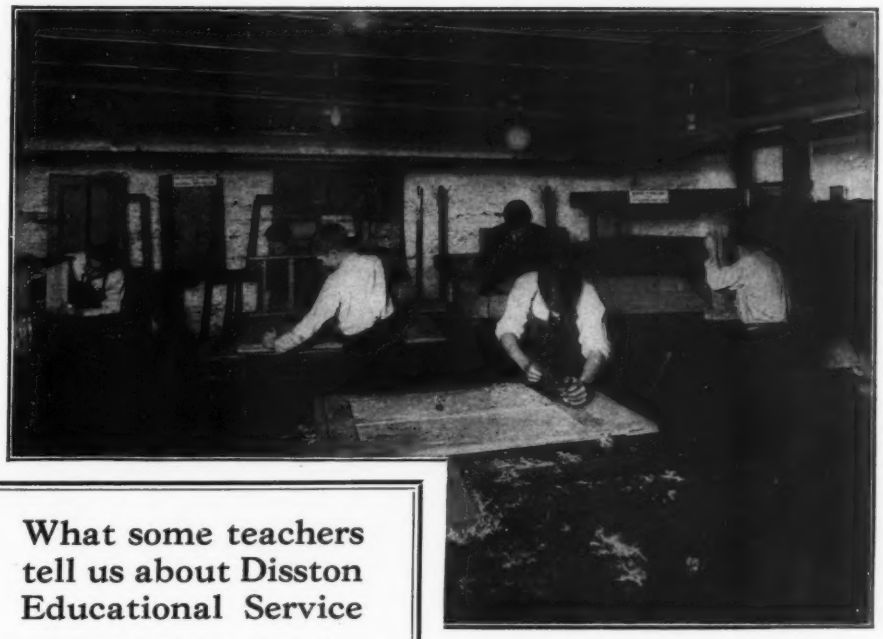
Mr. S. W. Schefelker brought to the convention a discussion of the apprenticeship law and vocational educational law of Wisconsin, as it operates in the Marinette Vocational School of which he is director.

An open round table discussion followed in which several members took part. Prof. K. G. McClintock, head of the manual arts department of the Marquette Normal School was elected chairman of the session for the year 1923-1924.

ORGANIZE INDUSTRIAL SECTION.

The Wyoming State Teachers' Association at its recent convention October 10-12, organized an Industrial Education Section composed of the teachers and directors of vocational schools and manual training departments of the state. Mr. James R. Coxen called the meeting and the department was organized with Mr. E. M. Wyatt of Casper as chairman. The meeting of the department will be held in October, 1924.

Better Work



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*"*******I wish to thank you for this valuable service the Disston people are rendering to vocational education. You are giving us something we cannot buy in text books.*******"*

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Letters containing expressions like those we quote, coming daily from teachers in all parts of the country, show us the part the Disston educational service and Disston Saws, Tools, and Files are playing in the work of training craftsmen in our schools.

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NEW BOOKS.

Industrial Arts for Elementary Schools.

By Frederick G. Bonser and Lois Coffey Mossman. Cloth, 491 pages, illustrated. Published by the Macmillan Co., New York.

The term "industrial arts" as used in this book applies to the study of those materials, processes and occupations "by which changes are made in the forms of materials to increase their values for human use." The authors define the purposes, the scope and organization and the relation of the industrial arts to other school subjects in a well-tempered, forward-looking discussion. They take up the psychology of teaching, the relationship to fine arts, and the specific organization of teaching materials for the respective grades. Throughout, they limit themselves to practicable suggestions, tested projects, and conservative estimates of end results. If our industrial arts teaching can be generally put on the high plane outlined, it will not need argument to justify its continuance.

The Business of Selling.

By Harold Whitehead. Cloth, 12mo, .247 pages. Price, $1.40. The American Book Co., New York, Chicago, Cincinnati.

This book outlines a practical course for colleges and vocational schools, and emphasizes the "how" of the selling process and the personal factors which make for success.

The A B C of Drawing.

By D. R. Augsburg. Cloth, 12mo. The Globe Book Co., Morristown, Tenn.

This is a teacher's guide to accompany a carefully graded series of classroom drawing tablets. The latter provide the drawings to be copied or suggest the object or form which the child is to draw. The course is particularly valuable where expert supervision is not provided.

Education for Moral Growth.

By Henry Neumann. Cloth, 383 pages. Published by D. Appleton and Company, New York.

A Practical Course in Roof Framing.

Richard M. Van Gaasbeek. Cloth, 263 pages, illustrated. Price $1.50. F. J. Drake & Co., Chicago, Ill.

This is a revised and enlarged edition of a book which has had a deservedly good sale in the carpentry trade and among schools where carpentry is taught.

It outlines the principles of framing various types of roofs with equal pitch, roofs with unequal pitch, gambrel roofs, curved and conic roofs. A series of problems taken from actual buildings is used to illustrate and apply the principles and methods advocated. The problems range from the simplest to the most complicated and involve every usual type of arrangement met with in good architectural practice. The book has the merit of breaking up complicated roofing problems into their rather simple component parts and establishes a clear cut method of thinking and working which the carpenter can apply in his daily work of laying out and constructing roofs. The illustrations are simple and well made.

PUBLICATIONS RECEIVED.

Designing Book Plates. Published by the Children's Week Committee, 334-5th Ave., New York City. An interesting circular for teachers of drawing suggesting methods of designing book-plates in schools.

General Industrial Training. Bulletin No. 9, A Syllabi of High School Subjects for the schools of the state of Minnesota. Price, $0.25. The Syndicate Printing Co., 417 Hennepin Ave., Minneapolis, Minn. A suggestive syllabus in general industrial training, prepared by a special committee of five, headed by George A. McGarvey, St. Paul, until his departure from the state in 1922. The pamphlet lists such courses as woodwork, drawing, elementary electricity, sheet metal, bench, metal and machine work, printing, automobile mechanics, household mechanics and farm shop work. Topics for lecture and discussion are given, as well as texts and references for study, and a few selected plans are included for the arrangement of typical rooms and their equipment.

Course of Study and Teacher's Manual for Evening Classes in Bituminous Coal Mining in the Public Schools. Bulletin No. 5, 1923, of the Trade and Industrial Education Series, Bureau of Vocational Education, Harrisburg, Pa. This bulletin which was prepared by Mr. William Penn Lewis of the Industrial Education Department, contains constructive suggestions and criticisms for use in teaching classes in coal mining. The pamphlet takes up the subjects of gaseous mines, non-gaseous mines, and fire bosses, and outlines for example, the aim of the course, buildings and equipment suitable for these classes, length of course, size of classes, teacher certification, and tuition for instruction.

Forty-Second Annual Report, Cincinnati Museum Association. This booklet outlines the work of the Museum accomplished during the year 1922.

NEWS AND NOTES.

Trade School. A trade school for the instruction of members and apprentices of the International Printing Pressmen's Union has been organized at Cincinnati, O.

The school which is located in the Bavaria building, is in charge of Mr. J. G. McDaniel. Sessions are held three evenings a week at the union headquarters and in some of the large shops of the city. The school is intended to reach the members of the union and to increase their efficiency.

French has been eliminated from the high school course at St. Clair, Mich., to offer opportunities for modern courses in household arts, manual training and physical education.

The schools of Andover, Mass., have reported a large increase in enrollment. A continuation school for children between the ages of 14 and 16 years, working in the mills, has been opened. Mr. C. M. Gahan is director of the school.

Caney, Kans. New courses in home nursing, household decoration and art have been added in the high school. The first course is open to both junior and senior girls and the last is for all girls of the school.

What the Erie Evening Schools Do. The Erie, Pa., evening schools provide first and second year work in mechanical drawing, sheet metal drafting, architectural drawing, plumbers' sketching, machine shop practicing, sheet metal course, electrical course and auto mechanics. Each study is accompanied with studies in mathematics.

The board of education in its issue of the "Evening School News" sets forth the purpose of the evening school as follows:

"Large numbers of people engaged in industry are employed in a variety of occupations differing greatly in the skill and knowledge demanded of the workmen. The problem of reaching these workers and training them for increased efficiency is the great task of the evening school.

"Many persons for economic and various other reasons are deprived of an education exceeding that of the elementary schools. At an early age they find themselves wage earners in a work-a-day world, and frequently find themselves stranded in a blind alley job. Their only hope for a change of vocation or for promotion is found in the evening school.

"It is from this group of people who have reached a place in life where they are very conscious of a definite need and willing to meet the requirements, that our night schools secure their enrollment."

Three girls who graduated from the art course of Washington Irving high school, New York City, last February are receiving $70.00 a week and another is receiving $50.00 in commercial art establishments. Two others who finished a course a year ago are receiving salaries of more than $100.00 a week.

The continuation schools of New York city have experienced an increase of 7,000 students bringing the total attendance up to 22,000. It is estimated that in a few years 150,000 students will have to be provided for. The courses include woodworking, electric wiring and installation, men's garment designing, printing, automobile mechanics, trade drawing, machine shop practice, home making, millinery, sewing and typewriting. The commercial course includes salesmanship, bookkeeping and office practice.

"This country lags behind the old world in the application of art to industry," says the Chicago Post. Europe and the Orient long ago wedded beauty and utility. The tradition of the craftsman survived the industrial revolution, and has carried over into the machine age an eye for form and color, an appreciation of design which we have failed to cultivate. Our industry is too nearly contemporaneous in its beginnings with the era of the power machine to have roots in a subsoil of artistic craftsmanship. Only in recent years have we begun to see what this means to us.

No danger of clouding or glazing with Prang Tempera Colors

Prang Tempera Colors, made of the finest materials in the most thoroughly equipped factories of their kind in the world, are the perfect medium for school design work.

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Properly applied, they will not cloud or glaze. They will not crack, or mold, or mildew while standing. They will not dust off after drying. They will remain intimately mixed, both while in use and while standing unused from one day to another.

They are adaptable for use on paper, cardboard or wood—almost any surface, wherever flat tones may be desired. The full palette of twenty-two colors will give all the elasticity or range of color needed for the finest work.

Write for our booklet, "How to Use Tempera Colors."

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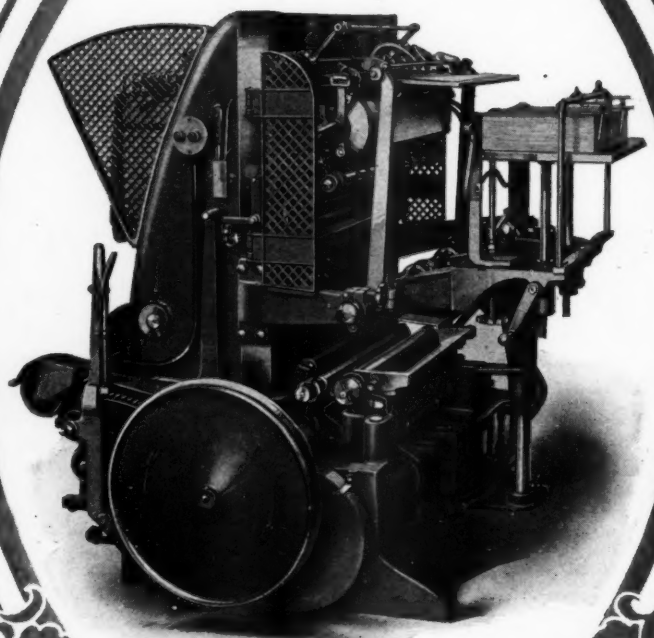

Inside Chase Measurement, 13¾ x 19¾
Type matter locked in chase, 12¼ x 19
Largest sheet which can be delivered, 12½ x 19
Speed range per hour, 2,000 to 3,600

THE MIEHLE-VERTICAL makes real the printer's dream of big production. It is a high-speed, extremely simple and thoroughly automatic job press capable of producing easily the widest range of printing. It has rapidly won the unqualified approval of printers everywhere. Twenty-five percent of the purchasers listed have placed repeat orders. It is certain that you need a Miehle-Vertical as part of your equipment.

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The Rockdale Herald, Glen Riddle, Pa.
Steinman & Steinman, Lancaster, Pa.
The Sentinel Co., Inc., Lewistown, Pa.
Norristown Herald, Inc., Norristown, Pa.
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Electric Storage Battery Co. Philadelphia, Pa.
Franklin Printing Co., Philadelphia, Pa.
Freihofer Baking Co., Philadelphia, Pa.
J. M. Kaupp & Son, Philadelphia, Pa.
MacDonald, Acton & Young, Philadelphia, Pa.
The Niles Press, Philadelphia, Pa.
The Hartmann-Bruderlin Stationery Co., Denver, Colo.
Peerless Printing & Stationery Co., Denver, Colo.
Geiger & Briesacher, East St. Louis, Ill.
Economy Advertising Co., Iowa City, Iowa
Citizen Printing Co., Iowa Falls, Iowa
Scott-Edwards Printing Co., Keokuk, Iowa
H. M. Ives & Sons, Topeka, Kans.
C. E. Brown Ptg. Co., Kansas City, Mo.
National Paper Box Co., Kansas City, Mo.
Unity School of Christianity, Kansas City, Mo.
Artistic Printing Co., St. Louis, Mo.
Buschart Bros. Ptg. Co., St. Louis, Mo.
Cap-Keystone Ptg. Co., St. Louis, Mo.
Jas. H. Cassel, Lafayette, Ind.
Warsaw Printing Co., Warsaw, Ind.
Otto Zimmerman & Sons, Newport, Ky.
Merchant Publishing Co., Kalamazoo, Mich.
Wolverine Sales Book Co., Lansing, Mich.
Thompson Printing Co., Cincinnati, Ohio
American Education Press, Inc., Columbus, Ohio
Natl. Cash Register Co., Dayton, Ohio
Weatherford Printing Co., Tuscaloosa, Ala.
Florida Baptist Convention, Inc., Jacksonville, Fla.
Haynes & Ratliff, Sanford, Fla.
John J. Harland Co., Atlanta, Ga.
Columbus Office Supply Co., Columbus, Ga.
Regal Printing Co., Reidsville, N. C.
Bridgeport Life Pub. Co., Bridgeport, Conn.
Clark & Smith, Hartford, Conn.
Conn. General Life Insurance Co., Hartford, Conn.
Finlay Bros., Hartford, Conn.
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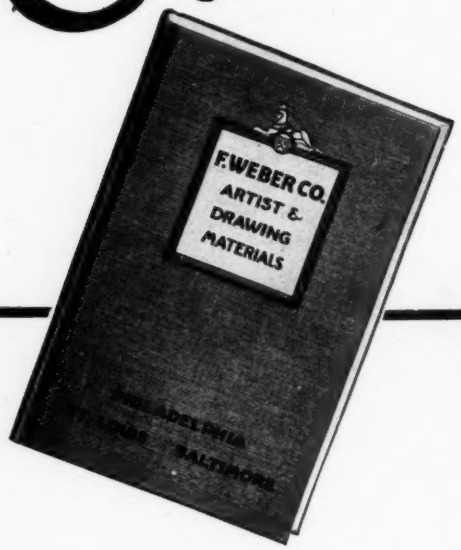

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NEWS AND NOTES.

Fine Print Shop. The senior high school at Sioux City, Ia., contains one of the best equipped print shops to be found in the middle west. The equipment includes three job presses, a cylinder press, linotype, metal furnace and casting machine, power cutter, power folder and metal saw. The course has an enrollment of about fifty boys and the classes turn out practically all of the printing needed by the schools, as well as the printing of the weekly school paper. The printing department is in charge of Mr. Wm. Baker.

Complete Prescribed Work. Two of the woodworking classes of the Sioux City High School, at Sioux City, Ia., have completed the six weeks' work prescribed for each semester comprising the making of equipment for the schools. In addition to several small jobs, the classes completed twelve kindergarten tables and twenty library tables. The balance of the semester the boys will devote to the construction of projects of their own selection. This former work is especially favored by the instructors, who feel that it makes possible the teaching of the various machine processes and gives each boy sufficient experience that he can proceed with his own work without much supervision. Mr. Lewis H. Wood is supervisor of industrial training.

Apprentice Training. Apprentice training in part-time day trade schools has been inaugurated at Chicago with considerable success. The schools, which are conducted under the direction of the Citizens' Committee to Enforce the Landis Award, form the highest type of trade school and will ultimately become the chief means for educating the trade apprentice. To date, 53,915 graduates of the school have been placed in various positions in the building trades.

Under the plan, the employer allows the apprentice one full day off every two weeks for four years, to attend school with pay. The advantages claimed for the plan are that the apprentice attends in the daytime when he is not tired, the eyesight is not impaired, befter work and more rapid progress are obtained from a fresh mind. The employer who engages an apprentice assumes the responsibility of teaching him the trade and he also experiences that satisfaction which comes from possessing an employee whom he has trained.

The plan has been approved by the architects and contractors of Chicago who find that building operations are conducted under clean and wholesome conditions, free from graft and strike troubles. They ask that the Landis Award Committee be made a permanent body in view of the fact that it is giving a real service to building operations in the city.

National Poster Competition. The Women's International League for Peace and Freedom at Washington, D. C., has announced a national poster competition on the subject of "World Peace." A total of 21 countries will be represented in the competition through the use of an international idea. Fitness, originality of thought, and technique will be considered in the judging of the designs. Prizes of $250, $150 and $100 will be offered for the first, second and third best designs submitted by the artists. The league requires that all designs be received by January 15 in order that they may be duly considered by the jury of award.

Placement Bureau. The United School Boards of the Bronx Borough, New York City, have adopted a resolution asking the board of education to establish a vocational and placement bureau. This bureau is intended to fit graduates of the schools for positions and to aid them in finding suitable employment. It is brought out that graduates of the schools profit very little from their years of training unless proper thought and consideration are given in each case with regard to the selection of the proper course, trade or calling for which he or she may be best fitted. Next to the parent or guardian, no one is better qualified than the principal and teaching staff to know and to judge the character, ability and habits of the pupils who have been under their care and observation for a considerable period.

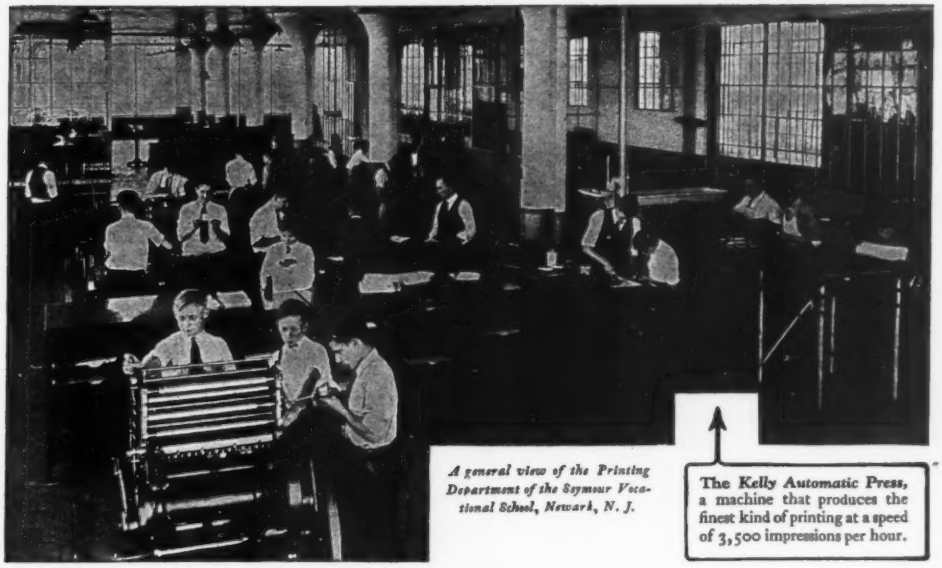
Apprentices Attend Carnegie. The Sheet Metal Contractors' Association of Pittsburgh and the local union of sheet metal workers have made a contract stipulating that every union apprentice must attend the sheet metal union at the Carnegie Institute during the last four years of his apprenticeship or until he has completed the course for sheet metal apprentices. Successful work in the institute is rewarded by increase of pay.

A Concrete Construction Laboratory Manual. By D. Scoates, A. and M. College of Texas, College Station, Tex. This manual is intended for agricultural students attending agricultural colleges. The material has been selected, compiled and arranged in such a manner as to stress only those things which will drive home the principles involved in good concrete construction. Considerable practical work is offered to insure a thorough understanding of the mechanical operations involved in the use of forms and the placing of concrete. Among the phases of the work covered are concrete tile construction, fence post construction, concrete block construction, and specifications for time and setting of Portland cement.

Industrial Arts Education in Grades Seven, Eight and Nine, of the Pennsylvania Schools. Prepared by Mr. Gerald D. Whitney, under the direction of Mr. L. H. Dennis, Director of the Bureau of Vocational Education, Harrisburg. The material contained in the bulletin has been developed for the assistance of the schoolmen of smaller communities who desire shop instruction in the upper elementary grades, or who wish to organize their seventh, eighth and ninth grade work on a junior high school basis. Two types of situations have been considered, i. e., the specific type that is usually installed in new schools, and the broadening of existing manual training shops to add new and varied activities not included in the wood shop alone. The pamphlet contains an appendix and a brief bibliography.

New Vocational Courses. A course in carpentry has been inaugurated at the high school, San Diego, Calif., for boys anxious to earn while in college, or for those who desire to choose the carpentry trade. The course, which is open to boys over 14 years of age, is two years in length and covers a study of carpentry, blue print reading, estimating and English. Two further courses in plastering and magnesite stucco are planned.

New Vocational Training Plan. A new plan of vocational training has been inaugurated at Wilmington, Del., under the direction of Mr. Anderson, and with the approval of the state director of vocational education. The plan provides that boys be placed in shops for six months to determine their ability for the trade chosen. They are then recommended to employers for apprenticeship training. Under this plan, the boys alternate between school and shop for the first two years. During the second two years they spend their entire time in the shop but attend night school four hours a week.



A general view of the Printing Department of the Seymour Vocational School, Newark, N. J.

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Beginning this fall, the vocational department offers seven courses representing the leading trades of the city, i. e., machine shop practice, automobile mechanics, electricity, sheet metal, plumbing, printing and drafting. The course provides that at the end of two years a boy may, if he chooses to go on to college, complete his high school course in two more years. The plan aims to give related technical training and knowledge along with the manipulative skill, and provides for related technical instruction and supervised trade practice. It assures to the apprentice opportunity for a complete and thorough training in the practical and theoretical phases of the work.

New Vocational School. The vocational high school at Southbridge, Mass., has been completed at a cost of $150,000. The building, which is two stories high, contains sixteen rooms, and offers courses in mechanical and textile subjects.

Printing Course. Printing has been added to the courses offered in the high school at Austin, Minn. The course, which is limited to school work, has an enrollment of twelve students. Mr. J. A. Keunta is in charge of the work.

Training for Miners. Vocational training for miners has been introduced in a number of high schools in Illinois, according to J. F. Kolb, supervisor of vocational education for the state department. The classes are held in the night schools where miners may fit themselves for better positions in the industry. The principal subject is mathematics as applied to coal mining.

Evening Vocational Course. The evening school at Schenectady, N. Y., offers a two-year course in machine shop work. At the completion of the work the student is given a certificate. The work is made up of units dealing with various types of work in the machine shop, and students may take any one of the units and continue to elect others until the course is completed. These units are as follows:

Bench and drill press work, including instruction in the various types of tools used, their sharpening, laying out work, tapping and reaming, babbitting and scraping bearings, hardening and tempering, drill sharpening and forging.

Grinder work, including surface grinding, external cylindrical grinding, internal grinding, magnetic chuck work, cutters, etc.

Shaper work, including vertical and taper shaping, table work surface shaping, keyway cutting, radius shaping, shaping to templet and swivel fixture work.

Milling machine work, including surface, straddle, keyway and index milling, differential indexing with single and compound gearing, reamer, fluting taper work, and cutting of spur, spiral and bevel gears.

Lathe work, including centering, tool sharpening, straight turning, knurling, facing, chuck work, boring and reaming, micrometer work, taper turning and threading.

Other courses which will be offered are sheet metal drafting for apprentices journeymen and helpers in the sheet metal and tinsmith trades; blue print reading for machinists and machine operators; trade mathematics for mechanics; commercial lettering, including the fundamentals of harmony and elementary design. This last is meant especially for printers who wish to improve their knowledge of composition, show card writers and window trimmers and school teachers who wish special instruction in elementary design work.

Evening Vocational Work. At the Boys' Vocational School, Newark, N. J., evening classes in automobile mechanics, tool making, machine shop practice, pattern making, cabinet making, roof framing, electrical wiring, presswork, typesetting, technical chemistry, tile setting, architectural drawing, machine design, English for printers and shop mathematics are offered. In addition there will be courses in trade information for carpenters, masons, and electrical apprentices.

Evening Design Course. At the Edison evening school, Schenectady, N. Y., a class in commercial lettering and design has been formed. The class is open to both men and women, and offers instruction in simple and applied design, lettering, initial letters and alphabets, design harmony and applied ornament.

Trade Training Courses. The Gladstone, Langley, Latimer, North and Ralston junior high schools at Pittsburgh, Pa., offer first-year high school work in trade training, commercial and academic courses. Special trade training courses are offered in certain high schools specially equipped for the work. Among the subjects offered are machine shop practice, electricity, printing, carpentry, motor mechanics, building construction and plumbing.

Industry Heads Approve Industrial Training. The owners of the local factories at East Moline, Ill., have approved the plan of the East Moline Township High School to enlarge its vocational training course. The purpose is to secure the cooperation of the schools and industries in a plan giving the boys the advantage of cooperative industrial training. A joint committee of the members of the board and the factories has been formed to select the equipment and to arrange a schedule of work combining school work with shop practice.

Department Self-Supporting. The manual arts department at Seward, Neb., will be self-supporting this year through a plan adopted for refinishing, repairing, and rebuilding of all kinds of articles upon order by the citizens. The department will also construct articles for sale to the public as in the past.

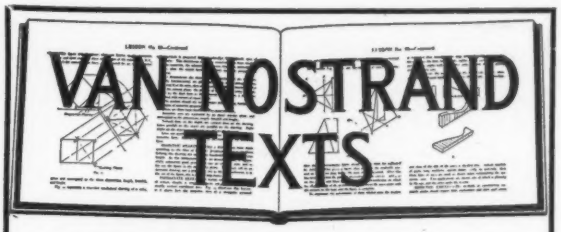
Paper Hanging Course. An evening course in paper hanging is offered this year at the McKinley Vocational School, Buffalo, N. Y. The course is intended for those employed in the trade who desire to advance themselves.

Evening Trade Courses. At the Boys' Vocational School, West Orange, N. J., courses are offered in automobile mechanics, electrical construction, carpentry, general wood working, cabinet making, wood working machine operation, house and roof framing, machine shop practice, and tool making.

School of Commercial Art. The Gredhan School of Commercial Art has been established at New Orleans, La. The school teaches commercial drawing and other phases of work connected with photo-engraving, printing and advertising.

Commercial High School. The new Commercial High School at Providence, R. I., has been occupied with the enrollment of both day and night students.

A feature of the third floor of this building is the section given over to the scientific laboratories, permitting the adaptation of the chemistry work to the needs of the industries. The course offers work in the mordants and dyes used in the textile industries, and how to prepare and analyse the characteristic Rhode Island technical products. The work is invaluable to those learning the dyeing and bleaching business, chemical trades, pharmacy, jewelry coloring and allied industries.



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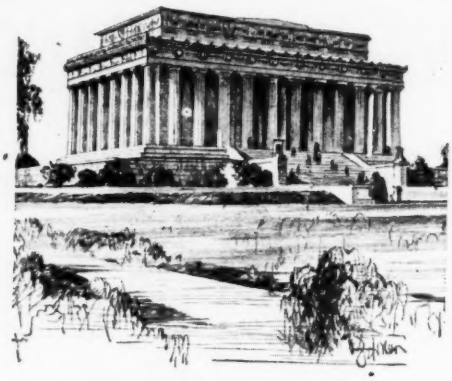

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Part-Time School. At Fostoria, Ohio, the school board contemplates the establishment of a part-time vocational school for boys and girls between 16 and 18 years, employed in the shops, factories and stores of the city.

Occupy New Building. The State Trade School, at New Britain, Conn., has occupied its new building completed last spring. The building is a three-story, fireproof structure and affords space for additional equipment in the automotive, machine and electrical departments. The enrollment for the day and night classes has been exceedingly heavy and additional instructors in printing and automobile work have been employed.

Offers Art Courses. Art courses in mechanical and freehand drawing, designing, household decoration, arts and crafts are being offered in the high school at Scituate, Mass. A vocational household arts school under the supervision of the state is conducted in connection with the high school.

Begins Fifth Term. The Evening Trade School of the Baldorioty de Castro Technical School, at San Juan, P. R., has opened for its fifth season. The term is the same length as that of the day school and the period of instruction is two hours per night. The school has experienced a steady growth and there is a large waiting list. The teaching staff is composed of 144 instructors under the direction of Mr. Herman Hjorth.

Evening Vocational Classes for Girls and Women. The evening vocational school for girls and women of Hoboken, N. J., opened for its twenty-eighth year on October 8. The work of the year has been enlarged to include new courses in home nursing, lamp-shade making, commercial art and figure drawing. The department is under the direction of a board of trustees of industrial education, a body of nine appointed by the governor, and having jurisdiction apart from the local board of education. The latter body has charge of the school for boys and men, who attend classes in the shops or drawing rooms four evenings each week. The board also maintains evening classes in English, mathematics, commercial subjects and Americanization work. Mr. Richard A. Beyer is in charge of the entire courses.

Evening School for Colored Persons. The evening vocational school at Atlanta, Ga., offers courses in carpentry, plastering, nursing and masonry for colored persons. Last year the school enrolled 273 students. An evening school for colored illiterates is also maintained. The students range in ages from 18 to 70 years and their main purpose is to learn to read for themselves. In the mill districts, two evening schools are conducted for white people employed in the mills.

Growth of State Vocational Work. The recent annual report of the Arkansas State Board shows that there has been a consistent growth in vocational work in 1923. The bulletin defines the three phases of vocational education as worked out in Arkansas and sets forth the aims and notes the progress during the five years the work has been in operation. The report shows an increased enrollment from 132 student farmers in 1918 to 3,224 at present. During the past year 116 schools made application for federal vocational work, which amounted to 46 schools and more than federal and state funds could finance, the total being 70.

In trade and industrial vocational work, 604 students are at present taking the work, an increase of approximately four times the original enrollment when the work began. Classes include evening schools and part-time classes as well as day unit trade school work.

Work in the home economics division is operated under the same system as all day-part-time and evening classes. The cottage plan has been inaugurated and at present the total enrollment of girls and women taking the work is 1,092.

The staff includes: A. B. Hill, director; E. B. Matthew, state supervisor of vocational agricultural education; R. B. Smith, itinerant teacher trainer, agricultural education; M. R. Ensign, resident teacher trainer, agricultural education; J. A. Presson, supervisor negro schools, agricultural education; H. C. Givens, state supervisor and teacher trainer, trade and industrial education; Stella Palmer, state supervisor and teacher trainer, home economics education, and Lo Ree Cave, assistant supervisor and teacher trainer, home economics education.

Approves Part-Time School. On October 10 the New York State Education Department approved the plan of the Van Raalte Company of North Tonawanda, for a private part-time and continuation school. The enrollment is about 40 and includes girls under 17 years of age who are not high school graduates. These girls pursue courses preparing them to become makers of silk gloves, and the time is divided between direct industrial training and general and related subjects.

New Manual Arts Department. The Union School, at Lyons, N. Y., has occupied its new building this term. The building contains rooms for commercial work, sewing, cooking, and manual arts.

Addition Occupied. The new Park School addition at Nutley, N. J., was occupied in September. The addition contains 24 classrooms, and rooms for art, mechanical drawing, cooking, sewing and music.

Checking Up Vocational Graduates. At Bayonne, N. J., the employment managers of the machinists', electricians', draftsmen's and patternmakers' shops have cooperated with the teachers of the vocational school in checking up members of the June graduating classes. At the June exercises, all the 43 graduates were given employment in their respective trades, and the present plan is to follow up these graduates to determine the effectiveness of the instruction given by the vocational school.

Industrial Work Expanded. The industrial department of the high school at Eureka, Calif., during the past two years has experienced a very substantial growth in attendance and interest. The two-story building erected two years ago has been found inadequate for housing the classes in drawing and automotive repair.

Sheet metal working has been enlarged in scope with the addition of new equipment. To take care of the increased enrollment, Mr. Robert Rotrammel and Mr. C. H. Pihl have been employed to assist Mr. B. G. Nason in the automobile and machine departments.

In the wood working department, the classes are larger than ever. The old machinery has been replaced by new heavy duty machines, connected to electric motors, and the old style manual training benches have been replaced by up-to-date cabinet benches of the efficiency type.

Printing has been introduced this year with the installation of a jobbing press, several cases of type and a linotype machine. The printing department is in charge of Mr. F. R. Shepard.

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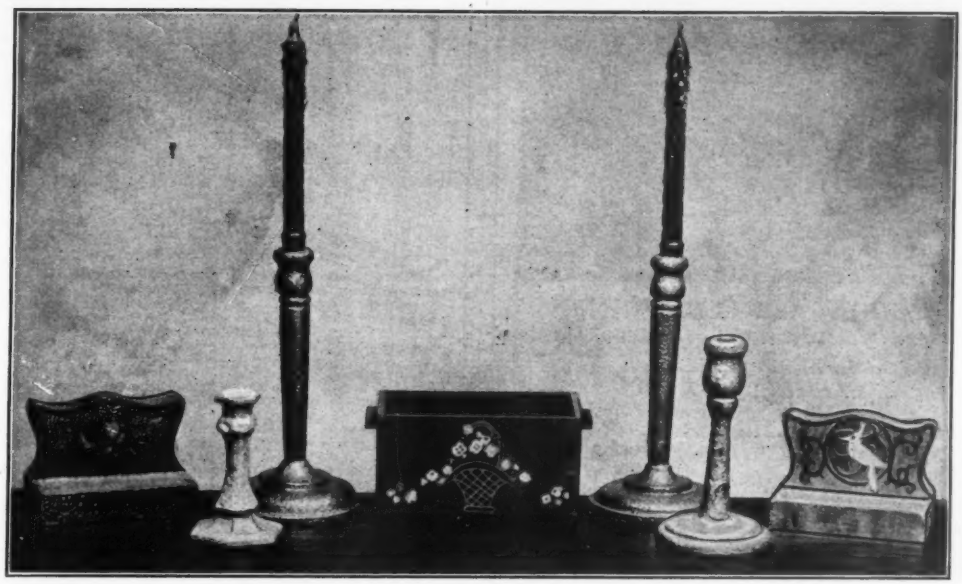

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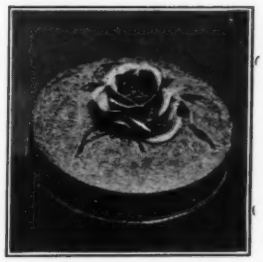

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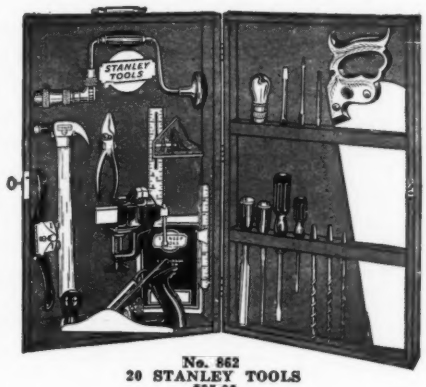

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Plans have been prepared for a new junior high school, and a wood working and industrial building in connection with the present high school plant. The entire work of the industrial department is in charge of Mr. John E. Doren.

Cooperative Vocational Education. A program of industrial education for the the textile industry has been adopted at South Manchester, Conn., after a try-out period of three years. The plan embraces cooperation of the local industrial organizations with the existing educational facilities and represents a coordination and cooperation of the South Manchester high school with the state trade school and the Cheney Brothers Silk Company.

Under the plan, each pupil receives his academic training in the high school, his textile groundwork in the trade school, and his practical experience in the mill during four years. He receives instruction in the processes of the textile industry and receives pay for ten hours' work per week, ranging from twenty to 35 cents per hour. Upon graduation he is taken into the plant and given intensive experience in a progressive manner so that at the end of three or four years he is available for work in any department. After the employee has gained experience in his chosen occupation he is placed under the guidance of a member of the executive staff where he is prepared for filling a position of responsibility.

Cooperative Trade Training. Bricklaying, plastering and plumbing are offered at the McKinley Vocational School, Buffalo, N. Y. The courses extend over two years and are so arranged that the boys spend one-half time in the shop and one-half in related work connected with the trade.

Train Automobile Experts. Garage owners at Milwaukee, Wis., have cooperated with the Milwaukee Vocational School in the training of automobile mechanics and specialists. Prospective mechanics over 18 years of age who enroll for the course, receive their tuition free and are given half-time positions in local garages, earning a living while learning the trade.

Under the plan, the student attends classes one week and works the next, alternating through the entire course, which takes one year. The student is paid a good wage for his work so that he can live comfortably during the week spent at school. The school has a most complete automobile plant and the instructors are practical mechanics, who have served at least five years in garage work. Factory specifications for each make of automobile are at hand and are used for instruction purposes. Following graduation, the students making the best showing go into the factory of whatever make of car they have specialized in, to complete their entrance into the ranks of experts.

FOURTEENTH MANUAL ARTS CONFERENCE.

The fourteenth annual conference of men representing institutions engaged in the preparation of teachers of manual arts and industrial education in the Mississippi Valley states, will be held November 15, 16 and 17, at the University of Illinois, Urbana. Dr. William T. Bawden of Tulsa, Okla., will be present to conduct the conference.

The headquarters of the conference will be at the Urbana-Lincoln Hotel, in Urbana. Day meetings will be held the first two days at the administration building of the University of Illinois at Urbana, and evening and Saturday sessions will convene at the headquarters hotel. The program is as follows:

The Program.

Thursday Morning, November 15.

Address, Dean Charles E. Chadsey, University of Illinois, Urbana.

The Content and Character of the Curricula for the Preparation of Teachers for Different Positions. (A report of a committee comprising R. W. Selvidge of the University of Missouri, Clyde A. Bowman of Stout Institute, and O. H. Day, University of Indiana.)

Thursday Afternoon, November 15.

Objective Tests and Measurements as Applied to Manual Arts and Industrial Subjects. (A report of a committee consisting of F. C. Whitcomb, Miami University; Ira S. Griffith, University of Wisconsin, and Homer J. Smith of the University of Minnesota.)

Thursday Evening, November 15.

Methods and Materials of Instruction in High School Manual Arts Courses. (A report of a committee consisting of E. T. Filbey, University of Chicago; G. B. Cox of the Wisconsin High School, Madison, and R. W. Woellner, University of Chicago.)

Friday Morning, November 16.

The Development of the Teacher in Service. O. H. Day, University of Indiana; H. J. Smith of the University of Minnesota; G. E. McLaughlin and E. L. Usry of Ohio University.

Friday Afternoon, November 16.

Progress in the Development of Plans for the Training of Teachers. Arthur B. Mays, University of Illinois; George E. Meyers, University of Michigan, and Homer J. Smith of the University of Minnesota.

Friday Evening, November 16.

Manual Arts in the Junior High School. (A report of a committee consisting of W. E. Roberts, Cleveland, O.; H. W. Schmidt of Madison, Wis.; A. C. Newell, Normal, Ill., and D. M. Schweickard, St. Paul, Minn.)

Saturday Morning, November 17.

The Future of the Manual Arts Conference. Ira S. Griffith, University of Wisconsin; C. H. Bailey of State Teachers' College, Cedar Falls, Ia.; C. A. Bennett of Peoria, Ill.; E. T. Filbey, University of Chicago; H. W. Schmidt of Madison, Wis., and A. B. Mays, University of Illinois.

Home Tanning of Leather and Small Fur Skins. By R. W. Frey, I. D. Clarke and F. P. Veitch. Farmers' Bulletin No. 1334, 1923. Issued by the United States Department of Agriculture, Washington, D. C. Ordinarily hides and skins may not be tanned by inexperienced persons. Small fur skins, or skins of low market value, may be tanned for home or country use according to the directions given in this bulletin. The pamphlet discusses preliminary operations, bark-tanned sole and harness leather, chrome-tanned leather, alum-tanned lace leather, and the tanning of fur skins.

Main Streets of the Nation. By Florence C. Fox. Bulletin No. 38, 1923. Issued by the United States Bureau of Education, Washington. A series of projects on highway transportation for elementary schools. The lessons offered have been demonstrated in a class of fifth-grade children and bear the impress of their reaction to the material presented. The lessons used by the class were typed copies from reports of highway commissioners or

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loose leaves from the various yearbooks of the highway associations. Each child made his own textbook from the material, bound together with outline maps, views of scenery and short reading lessons on each subject. Among the subjects covered by means of the material are geography, science, civics, history and literature. The pamphlet contains a good bibliography and a list of references to be used in connection with the subject.

PERSONAL NEWS.

Mr. Walter J. Pearce of Salem, O., has been appointed supervisor of the manual training annex at St. Marys, O.

Mr. Homer U. Miles has been appointed director of vocational education at Galveston, Tex. Mr. Miles will take charge of the entire vocational work of the schools which has been expanded under a new plan of cooperative industrial education. New courses in plumbing, drafting, automobile mechanics, machine shop work and electricity will be offered in addition to the former established subjects.

Mr. J. Scott Wiseman of Dillon, Mont., has gone to the University of North Dakota, Grand Forks, where he has accepted the position of assistant professor of drawing, in the Department of Engineering.

Miss Hazel Thompson of Mound Valley, Kans., has accepted a position as instructor of domestic art in Kansas City.

Mr. Arthur Fishbacka, assistant superintendent of vocational education in the Township High School, at Waukegan, Ill., has accepted a similar position in the high school at Jacksonville, Fla. Mr. Fishbacka is succeeded at Waukegan by Mr. C. L. Jordan of Mt. Carmel.

Mr. A. C. McClurg of Storm Lake, Ia., has become supervisor of manual training in the grades at Topeka, Kans.

Miss Grace Schermerhorn, who for the past six years was director of home making in the city schools of New York City, has become associate director of the Health Education Division of the Child Health Association. In her new work, Miss Schermerhorn will serve teachers of home economics in elementary schools all over the country, working with them to make their programs in home economics function as programs of health education for their pupils.

Miss Mabel Chase, Supervisor of Art at Newark, N. J., since 1916, has been retired on pension, after the completion of 35 years of service in the Essex County Schools. Miss Chase entered the school service as a grade teacher in 1888. In 1900 she came to Newark as a teacher of art in the high school, and as assistant supervisor of drawing in the grades. Later she became a full-time assistant to the supervisor, and in 1916 was promoted to the supervisorship. Miss Chase's enthusiasm in the work was contagious and the mechanical nature of her duties never affected her progressive spirit. Her skill and efficiency were recognized and her influence was potent throughout the system in giving to all school exercises some touch of art, and in making the classrooms and buildings more attractive.

Mr. Miguel Domingo has been appointed instructor of electric wiring at the Roman Baldorioty de Castro Technical School, at San Juan, P. R. Mr. Domingo spent three years and a half at the Milwaukee School of Engineering. He formerly held the position of chief of the electrical repair department for the Porto Rico Railway and Power Company.

Mr. Paul L. Schoenoff is teaching printing and wood working at Independence, Ia. Mr. Schoenoff completed two years' training at Stout Institute.

Mr. O. J. Haney is in charge of the mechanical drawing classes and senior wood working at Independence, Ia. Mr. Haney has entered upon his fifth year of work at Independence.

T. L. Anderson, formerly manual training instructor in the Minden, Nebr., High School, and for two years in charge of the primary industrial class at the Iowa School for the Deaf in Council Bluffs, has been placed in charge of all trades teaching at the latter school. Mr. Anderson's immediate task is to organize the various departments now doing trade instruction, and to bring the whole into coordination with the academic department of the institution. There are 300 pupils in this school, and a splendid plant is maintained under the Iowa State Board of Education.

TRADE PUBLICATIONS.

Catalog of Wood Carvers' Tools. Hammacher, Schlemmer & Co., New York, distributors of hardware, tools and supplies of various kinds, have just issued their new catalog No. 582, describing and illustrating the J. B. Addis, London carving tools and accessories. These tools are standard, are made of the best tool steel, carefully tempered, and are guaranteed to be perfect in design and workmanship. The firm points to a number of schools which have been satisfied users of its wood carving tools and refers to them as proof of its ability to serve and please the most exacting customer.

New Thurston Catalog. The Thurston Manual Training Supply Company, Anoka, Minn., has just published its new catalog for 1923-24, and copies may be had free on request by any manual training teacher. The catalog lists a large variety of "Hard-to-Get" materials for use in furniture making, wood finishing, etc. To illustrate some of the novel items we may mention hardware for sectional bookcases, cedar chest trimmings, tea-wagon wheels, phonograph hardware, extension table slides, wire lamp shade frames, office chair spiders, typewriter desk fixtures, etc.

A Book on Pigments. F. Weber & Company, of Philadelphia, have just issued a new book on Artists' Pigments, by Mr. F. W. Weber, technical director of the firm and lecturer at several eastern art schools. The purpose of the book is to give artists and teachers complete technical information on the commercial composition and the use of pigments in painting and other fine arts. Complete circulars descriptive of the book have been prepared.

New Universal Woodworking Machines. The Crescent Machine Company, Leetonia, O., has just announced the completion of a new series of universal woodworking machines and has prepared an illustrated booklet describing them. The series includes twelve distinct sizes, designed to fit the needs of small, medium size, and large shops. The machines are entirely self-contained, motor-driven and fully safeguarded. The complete models include a band-saw, jointer, saw table, shaper, borer, and a series of attachments, including a tenoner, panel raiser, emery wheel, wood-turning lathe, disk grinder, hollow chisel mortiser, spoke tenoner, molding head, wheel saw, huther groover, etc. School authorities can obtain full literature on request.

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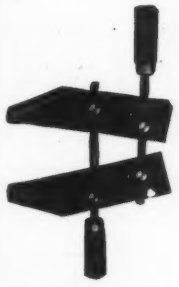

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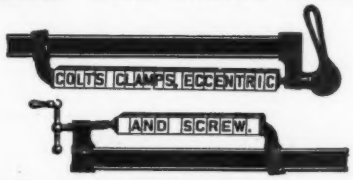

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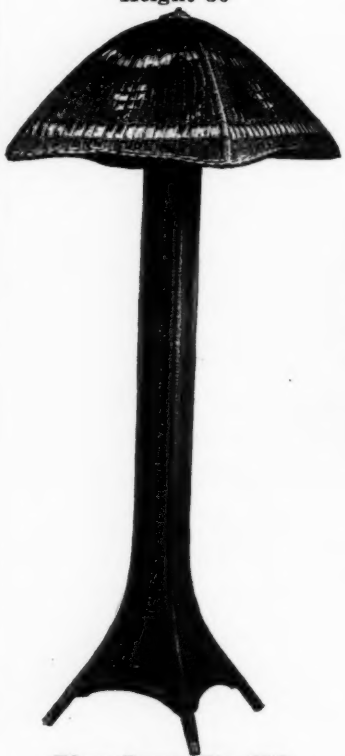

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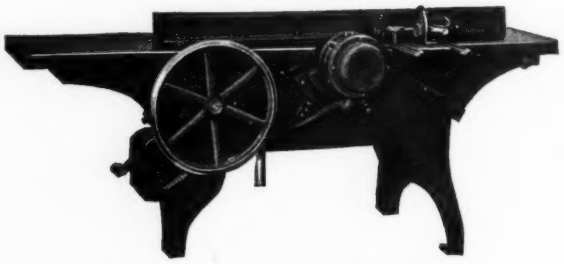

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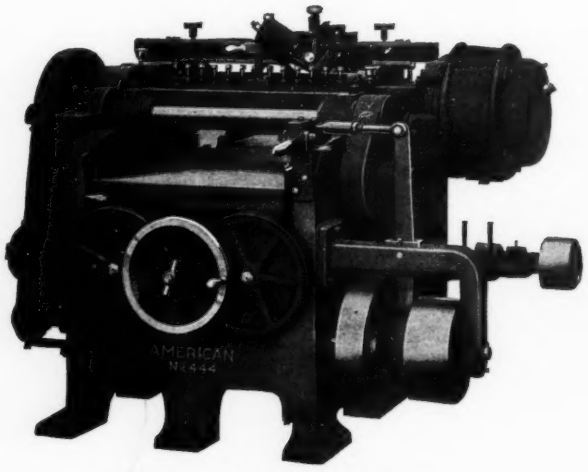

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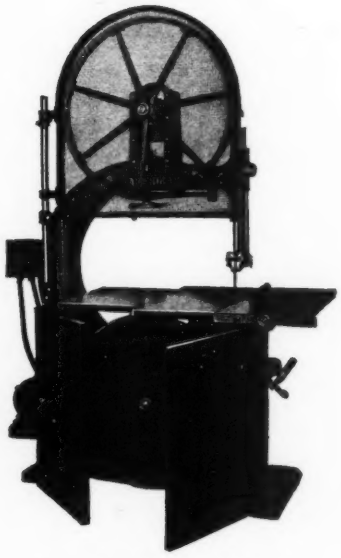

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